TROPICAL DISEASES BUREAU.

TROPICAL DISEASES BULLETIN.

Vol. 21.] 1924.

TROPICAL DERMATOLOGY.

OHO (O.). **Ueber die Hautkrankheiten in Nordformosa und einige therapeutische Bemerkungen ueber dieselben.** [Skin Diseases in Northern Formosa and some Therapeutical Notes on them.]—*Trans. 4th Congress of the Far Eastern Assoc. of Trop. Med.* 1921. Vol 2. pp. 149–168.

A list comprising 9,451 cases of skin diseases is given in tabulated form, arranged according to their monthly incidence and occurrence in the sexes. With the exception of the more unusually encountered diseases such as Tinea imbricata, the large majority of skin diseases observed in this district are of cosmopolitan nature. Cases of eczema occur in large numbers especially during the summer months. Under the designation "dermatitis exsiccans palmaris" is described a chronic affection of the flexural surfaces of the fingers and palms especially of the right hand, occurring chiefly in women and on tender skins, and improving in the summer. The clinical and histological appearances are those of eczema, while subjective symptoms are very few. This condition is ascribed to a fungus infection in spite of repeated negative findings. The appellation "dermatitis ruberrima" is given to an eruption of numerous very small pustules arranged in a streak-formed distribution chiefly on the uncovered parts of the body. Histologically the lesions show alterations in the epidermis as low as the stratum malpighii, with perivascular infiltrations in the papillary layer. It is suggested that this affection may be due to the irritation of some poisonous material from insects. Insect bites are common especially of a *Ceratopogon*. In the warm weather, particularly, eczema marginatum is of frequent occurrence especially about the buttocks and lumbar region, while it is noted that in Southern Formosa the condition frequently is seen on the neck alone. "Pityriasis rotunda" is mentioned as attacking only the Japanese. Under the denomination "eczema scroti parasitarium" a condition is described as occurring in epidemic form in young people, of small round scaly macules, becoming confluent, on both sides of the scrotum and on the shaft of the penis in contact with it. In the scales from these lesions a fine mycelium is easily recognised to which the name "microsporon brachytomum" is provisionally given. This fungus has been cultivated and successful inoculation experiments with the same have been [illegible] out by the writer. The mycelium grown from cases of T. imbri-[illegible]ed cultures giving the appearance described of *E. concentricum* (Castellani). Ulcus tropicum is not so often seen as formerly and now prevails among the lower classes. Scabies is very prevalent, and for this infection treatment by the application to the whole body for two days of a watery solution of "desinfektol" 20 per cent. with 10 per cent. precipitated sulphur is recommended.

Wm. Jenkins Oliver.

FONTOYNONT (Maurice) & BOUCHER (Humbert). **Contribution à l'étude des mycoses de Madagascar.**—*Ann. de Dermat. et de Syph.* 1923. Apr., May. 6th Series. Vol. 4. Nos. 4 & 5. pp. 209–235 With 3 figs. pp. 318–344. With 7 figs.

This long article is based on the observation and laboratory examination of 11 cases of mycotic infection. Four main groups of fungus are described, viz.:—Sporotrichum, Cryptococcus, Mycoderma and Acremonium.

Sporotrichum.—While not infrequent among horses, cases of infection with mycoses of this genus are rare in man. Two cases of this series were infections of *S. beurmannii* and *S. gougeroti* respectively. Attention is drawn to the picture common to all scars following deep mycotic lesions of the destruction of the hypoderm under an apparently healthy epidermis giving rise to a wrinkled appearance of the skin.

Cryptococcus.—Three new species are described. Three cases were infections of *C. mena.* The lesions resembled syphilitic and tuberculous ulcerations of the skin and occurred on the feet, legs, face, and on the trunk about the left breast and axilla with abscess formation following lymphangitis. Treatment by the internal administration of methylene blue (10 cgm. in cachet daily) and the local application of a 1 per cent. solution of the same acted as a specific. A cultural characteristic of this species was the rose colour on glucose agar, becoming more pronounced as the cultures became denser. On maltose agar the colour was always rose-brown. Liquefaction of gelatine and the absolutely smooth membrane of the yeast elements distinguished this species from *Saccharomyces granulatus.* The rose pigment of *C. mena* was no more constant than the yellow pigment of Staphylococcus. The agglutination reaction, to be a positive one, appeared to be dependent upon the presence of methylene blue in the mixture. The experimental effects of passage through four series of animals are described. This species appears to resemble *C. ruber* closely.

C. bernasconi occasioned two cases. One showed a mycotic chancre-like lesion on the face, while the other exhibited extensive ulcerations of the skin of the thorax with multiple suppurative adenitis of the cervical and axillary glands. Cultures of this fungus were white on all media. The cultural and microscopical appearances are described together with inoculation experiments. One positive retroculture was obtained.

C. fuscus was isolated from a case resembling a mycetoma of the foot and from an ecthyma of the leg following a prick from an agave. On culture a growth of a white creamy tint passing through brown to a caramel colour towards the end of the second month was characteristic of this species. Liquefaction of gelatine occurred. Inoculation experiments into animals are described. Retroculture from the intestine of one pigeon was positive.

Mycoderma rabesalama. The case was a pulmonary infection giving rise to haemoptysis and pulmonary abcesses with a dark colored expectoration mixed with blood, having a stale odour and showing white caseous-like granules. The death of this patient occurred after three years' duration of the illness. The cultures and microscopical appearance of the fungus obtained from the sputum are described, as are also the negative retrocultures from inoculations into animals and the positive complement deviation in the patient's serum. This is the first case of infection by this fungus to be reported from Madagascar.

Acremonium muthuoni. The case showed two nodular lesions in the nuchal region with discrete papular lesions on the scalp. The histological appearance is described together with the cultural characteristics of this new species. A partial deviation of the complement was obtained in the serum. A retroculture was positive from the peritoneal surface in the case of one guinea-pig.

W. J O.

CASTELLANI (Aldo) & WILKINSON (A. Geden). **Trichomycosis Axillaris Flava, Rubra and Nigra.**—*Jl. Trop. Med. & Hyg.* 1923. June 1. Vol. 26. No. 11. pp. 186-190. With 1 coloured plate and 3 figs. [8 refs.]

The varieties of the trichomycoses affecting the axillary and pubic hairs are described with their particular cultural and clinical features, together with the microscopical appearance of the affected hairs. While T. flava and T. rubra affect axillary and pubic hairs, the authors have observed no case with the pubic hair showing T. nigra. Mixed types may occur. Hyperidrosis is common but only in one case had chromidrosis been observed in association with trichomycosis. An erythematous condition of the axillae and a yellow discolouration of the skin in that region had been noted as complications. In such a discoloured patch a nocardial fungus has been demonstrated in one case. The differential diagnosis is discussed with the prognosis and treatment of the condition. The paper is accompanied by an admirable coloured plate.

W. J. O

LEGER (Marcel) & NOGUE (Maurice). **Mycose à** *Scopulariopsis* **chez deux malades ayant des lésions cutanées rappelant la lèpre.**—*Bull. Soc. Path. Exot.* 1922. July 12. Vol. 15. No. 7. pp. 654-661. With 3 text figs. [3 refs.]

Report of two cases, of 15 and 10 years' duration respectively, from which the same fungus was isolated. In neither case was there any family history of leprosy.

The first case was a man showing a raised circumscribed red plaque with a steep outer edge on the central part of the forehead and invading the hairy scalp, raised scaly circumscribed lesions on the forearms in glove-like distribution, hyperkeratosis of the palms with trophic disturbances of the nails of the fingers which were flexed and could not be completely extended. Removal of the scales revealed a darker black tint of the underlying than of the healthy skin. Similar circumscribed less pronounced lesions on the dorsal surfaces of the feet and lower part of the legs. Radiological examination showed some decalcification of the bones of the hands especially about the epiphyses. The nerves in the elbow regions were palpably thickened without any nodosities.

The second case was that of a woman with similar but less pronounced lesions on the face involving the forehead, cheeks and nose, the dorsal surfaces of both hands of the fingers where the skin was dry, shiny black and desquamating; palmar hyperkeratosis and deformed finger nails. Slight pruritus. Nerves not hypertrophied. Old syphilitic scars about left axilla. In both patients the Wassermann reaction was positive.

In neither case were *B. leprae* isolated from the skin lesions or from the nasal mucus nor was there any alteration of sensation over the areas of affected skin. While the diagnosis of leprosy in these two patients could not be entirely ruled out the condition was believed to be a mycotic infection in consideration of the isolation of a fungus from the scales and from the definite improvement following the local application of an ointment containing chrysophanic acid.

Cultures on Sabouraud's medium appeared in 5–6 days at laboratory temperature as a dirty-white felted growth which grew rapidly to take up a wavy formation and at the same time became green in colour to appear later of a darker slaty grey tint. More detailed cultural and microscopical characteristics are described, and the denomination of this fungus is discussed.

W. J. O.

NEVES (Aroeira). **Contribuição ao estudo das dermatomycoses em Bello Horizonte. Observações sobre casos provocados pelo** *Microsporon felineum*, **C. Fox e F. Blaxall 1896.** [Dermatomycoses in Bello Horizonte due to *Microsporon felineum*, Fox and Blaxall, 1896.] - *Brazil Medico.* 1923 Mar. 17. Year 37. Vol. 1. No. 11. pp. 144–149

Details are given of eleven cases of skin affection associated with *M. felineum*. Among these there was only one adult. Cultures of the organism were obtained in each case. In eight the disease was confined to the smooth skin, the scalp being affected in three only. The same organism was isolated from sores on 10 cats and 2 dogs living in close contact with the patients.

H. Harold Scott.

FRASER (A. Reith). **A Specialized Favoid Scalp Condition peculiar to the Syphilitic Native of South Africa.**—*Brit. Jl. Dermat. & Syph.* 1922. Aug.-Sept. Vol. 34. Nos. 8/9. (Nos. 406/7). pp. 267–274. With 2 plates.

Account of a chronic, dry, white-crusted condition of the scalp found only in syphilitic natives of South Africa, the large majority of cases occurring among the heredosyphilitics in British Bechuanaland. The commonest incidence is between the ages of 2 and 10 years and is commonly associated with other signs of heredosyphilis such as anal condylomata, chronic rhinitis and "mulberry molar." Commencing on the scalp as isolated syphilitic macules which become papular then pustular, the crusted lesions coalesce to cover the greater part of the scalp. The layers forming the crusts are firmly bound together so that the hairs through trophic changes become brittle and then fall, when the whole scalp may appear denuded of hair "except round the nape of the neck and in front of the ears. When a crust is raised or removed, a red non-inflamed denuded surface is revealed, practically devoid of serous or sanguineous exudate." No subjective symptoms accompany the disease, nor is it contagious.

After persisting for years, the crusted lesions if left alone may disappear about puberty with the other manifestations of the congenital disease. Under antisyphilitic treatment the condition improves and may entirely clear up, to relapse later. MITCHELL and ROBERTSON from four long-standing cases have isolated a fungus resembling *Achorion Schönleinii*, but this is probably a secondary contamination, since it is difficult to account for the non-irritating and non-contagious nature of the affection if due to a local fungus infection. The exact relation of the *Spironema pallidum* to the condition is undetermined. The disease, known locally as *wit kop*, has been observed by the writer in an adult native with acquired syphilis.

W. J. O.

CASTELLANI (Aldo). **L'étiologie du Tokelau.**—*Bull. Soc. Path. Exot.* 1923. Feb. 14. Vol. 16. No. 2. pp. 111–118. With 1 plate & 2 figs. [4 refs.]

The causal parasite of Tokelau ringworm is a fungus growing among the cells of the superficial and prickle-cell layers of the epidermis. Botanically this *Endodermophyton* is closely related to the *Achorion*. Three main types have been isolated and named by the writer, viz.:— *E. tropicale*, *E. indicum* and *E. concentricum*. The cultural characteristics of the two first varieties are described in some detail and compared. Emphasis is laid upon the necessity of not using corked or rubber-covered tubes in making the cultures, and upon the advisability of employing only young cultures for experimental inoculations. Other fungi, such as Aspergilli, which have been found in the scales are merely saprophytic contaminations.

W. J. O.

SILVA (Flaviano). **Intertrigo saccharomycetico.**—*Brazil Medico.* 1923. Aug. 25. Year 37. Vol. 2. No. 8. pp. 119–127. With 5 figs. [20 refs.]

The term " Intertrigo " is used to designate a group of skin lesions resulting from friction originated by a variety of causes such as irritant secretions—sweat, urine—or external irritants as chemicals, bacteria, or fungi. In the present paper the author deals only with mycotic intertrigo.

Two cases are recorded, one of interdigital and one of genito-crural intertrigo; from the lesions in each case a blastomycotic organism of the Saccharomyces group was isolated and grown on Sabouraud's medium, but was not identified. The history, symptomatology, differential diagnosis and treatment of the condition in general are given, chiefly from the writings of various authors.

H. Harold Scott.

DE MAGALHAES (Octavio) & NEVES (Aroeira). **Contribution à l'étude des teignes au Brésil** (*Trichophyton multicolor* **n. sp.**).—*C.R. Soc. Biol.* 1923. Oct. 13. Vol. 89. No. 27. pp. 769–772. With 1 fig.

Report of a case of ringworm of the scalp of eight months' duration occurring in a child aged 10 years. Direct examination of the hairs and scales were negative while cultural examinations were positive. On Sabouraud's maltose medium the cultures showed a cerebriform (occasionally crateriform) growth, ochre-coloured in the centre with an intermediate rose-tinted zone and an outer border of snow white colour, which outer zone might later (at 25 days) become salmon coloured. The cultures at first "downy" later showed a powdery surface. The cultural characteristics on other media and the biological appearances of the fungus are described. Pleomorphism occurred on all the media employed. Animal inoculations were positive. The fungus was shown to be an endo-ectothrix and should therefore be placed in the neo-endothrix group of Sabouraud's schema. The clinical and cultural characteristics of this trichophyton, to which the designation *T. multicolor* is given are very briefly compared with those of *T. cerebriforme* and *T. plicatile* (SABOURAUD).

W. J. O.

LYNCH (Kenneth M.). **Aspergillus in Scalp Lesions following Red-Bug (Leptus) Bites.**—*Arch. Dermat. & Syph.* 1923. May. Vol. 7. No. 5. pp. 599-602. With 1 text fig.

A brief account of the activities of the "red-bug" is given. From the heaped up crusted lesions on the scalp a fungus was obtained and shown to be *Aspergillus fumigatus* which was considered to be the cause of the continued formation of the crusted lesions at the site of the bites on the scalps of children. The hairs were not infected. Treatment with sulphur ointment, after removal of the crusts, caused disappearance of the lesions in 10–14 days.

W. J. O.

SCHMITTER (Ferdinand). **The Aetiological Fungi of Tinea Versicolor and Tinea Flava.**—*Jl. Trop. Med. & Hyg.* 1923. June 1. Vol. 26. No. 11. pp. 190–194. With 3 text figs.

The cultural characteristics of the fungus obtained from four cases of Tinea versicolor and from one case of Tinea flava are described. The conclusion is drawn that the causal fungi of these two conditions are different species of a similar organism.

W. J. O.

CASTELLANI (Aldo) & TEJERA (Henri). **Note on the Etiology of "Cute."**—*Jl. Trop. Med. & Hyg.* 1923. June 1. Vol. 26. No. 11. pp. 183-184. With 1 text fig.

In a case reported from Venezuela, scrapings from the yellow patches examined in liquor potassae showed the presence of scanty spore-like bodies with few mycelial particles resembling in appearance the fungus described from the condition of Tinea flava.

W. J. O.

REISS (Friedrich). **Eine eigenartige Nagelmykose in China (Onycholysis trichophytica).** [A Peculiar Mycosis of the Nails in China]. —*Dermat. Woch.* 1923. July 21. Vol. 77. No. 29. pp. 891–892. With 1 fig.

Case report of a man whose nails on the index, middle and little fingers of the right hand had been gradually for one year, undergoing the present, changed appearance. Seven years previously he had had ringworm of the body, but the nails had not been affected at that time. Now the three above named fingers showed small, half-moon shaped, raised remains of the nails with some slight swelling of the nail fold. Scraping and microscopical examination revealed the presence of fungus in considerable amount, which cultures and inoculation experiments proved to be an endo-ectothrix resembling Trichophyton A and Trichophyton B described by OTA as occurring in Manchuria. The relation of the present to the past infection was obscure.

W. J. O.

VALENZUELA (A. J.). **Clínica Médica del Hospital General de Guayaquil. Tercera Conferencia Esporotricosis. Primer caso señalado en el Ecuador.**—26 pp. With 13 plates. [24 refs.] 1922. Guayaquil: Tipografia de Julio T. Foyain- Avda, " 10 de Agosto " 220.

The case is described of a girl, 8 years of age, who sustained an incised wound of the foot. Bleeding was profuse and the wound slow to heal, so that three months later there was a small, painless swelling with an ulcerating surface. This became crateriform with undermined edges and was at first thought to be a leishmanial infection. Cultivation of the discharge on Sabouraud's medium gave a growth of " Rhizomucor " which, if it prove to be a new species, the author proposes (regardless of concord) to name *Rhinocladium guayaquilensis.* Treatment with iodides gave excellent results. The case is of interest as being the first recorded of Sporotrichosis in Ecuador.

H. Harold Scott.

BRUN (R. G.), BROC (R.), BURNET (Et.), ANDERSON (Ch.) & SOLOVIEF (P.). **Trois nouveaux cas de mycétome (pied de Madura) observés en Tunisie.**—*Arch. Inst. Pasteur de Tunis.* 1923. July. Vol. 12. No. 2. pp. 199–204. With 1 plate. [1 ref.]

Reports of three cases of mycetoma of the foot due to *Discomyces madurae,* the parasite being found microscopically in one case and grown in cultures from the other two cases. This account raises to the number of seven the cases observed in Tunis due to Discomyces.

W. J. O.

NOGUE (M.) & LHUERRE (H.). **Un cas de mycétome à grains rouges.**—*Bull. Soc. Path. Exot.* 1922. Nov. 8. Vol. 15. No. 9. p. 862. With 1 text fig.

Report of a case of 10 years' duration involving the hypogastrium, left internal iliac fossa and middle third of the left thigh. The internal and external administration of iodine produced some slight improvement.

W. J. O.

SHEAR (C. L.). **[Life-History of an Undescribed Ascomycete isolated from a Granular Mycetoma of Man.]**—*Mycologia.* 1922. Vol. 14. No. 5. pp. 239–243. With 3 figs. [Summarized in *Rev. Applied Mycology.* 1923. May. Vol. 2. Pt. 5. pp. 226–227.]

A pleomorphic fungus isolated from a human ankle in Texas. The lesion had lasted 12 years and resulted from a thorn injury. The characters of the fungus are described. It is named *Allescheria boydii.*

A. G. B.

DONG-NGOC-DIEU & MILLOUS (P. L. E.). **Traitement des trichophyties dans les pays chauds par les injections intraveineuses de liqueur iodo-iodurée.**—*Paris Méd.* 1923. July 28. Vol. 13. No. 30. pp. 88–89.

For tropical dermatomycoses, so frequent and persistent, treatment by intravenous injections of Lugol's solution is recommended. Commencing with 5 cc. then 8 cc. and 10 cc. solution, these injections were given every second day to a total of 5 to 20 injections, according to the nature of the causal parasite, the last mentioned figure being often required in cases of "tokelau."

W. J. O.

SCHAMBERG (Jay Frank) & KOLMER (John A.). **Studies in the Chemotherapy of Fungus Infections. I. The Fungistatic and Fungicidal Activity of Various Dyes and Medicaments.**—*Arch. Dermat. & Syph.* 1922. Dec. Vol. 6. No. 6. pp. 746–754. With 3 text figs. [1 ref.]

Twenty-one chemical compounds or drugs and nine dyes were investigated to show (1) their fungistatic effect, *i.e.*, their power of restraining or inhibiting growth and (2) their fungicidal effect on cultures of *Trichophyton rosaceum, Microsporon Audouinii* and *Achorion schoenleinii.* Twenty-four dilutions of each compound were tested against each of the three moulds planted on Sabouraud's maltose medium. Of the drugs iodine showed the strongest inhibitory and sodium oxymercury orthonitrophenolate (mercurophen) the strongest fungicidal powers, while of the dyes brilliant green was the strongest restrainer and crystal violet the most powerful fungicide. The bactericidal properties of some of these compounds and dyes are tabulated for comparison with their actions on fungi. The authors remark on the comparatively weak inhibitory and killing effects on cultures of several drugs more commonly employed in the local treatment of these fungal infections.

W. J. O.

PARDO-CASTELLO (V.). **Dermatitis Venenata: A Study of the Tropical Plants producing Dermatitis.**—*Arch. Dermat. & Syph.* 1923. Jan. Vol. 7. No. 1. pp. 81–90. With 2 text figs. [1 ref.]

This article contains a list of 40 plants of the Antilles which produce skin reactions either by the chemical action of the latex or by the mechanical irritation of the hairs and prickles, in some cases combined with the irritating action of the oil contained in the hair cells. Four main botanical groups are mentioned, with a more detailed account of the skin lesions produced by their different species and of the physical and chemical properties of these same. Attention is drawn to the increased severity of the skin lesions when occurring on moist skins.

W. J. O.

ADAMS (Walter Booth). **Ulcus Epidemicum. A Preliminary Report.**—*Arch. Dermat. & Syph.* 1923. May. Vol. 7. No. 5. pp. 605–610. With 2 text figs. [7 refs.]

During the period 1916–22, with a maximum incidence in 1919, a series of cases of ulcers on the exposed parts occurred in epidemic form among the indigenous poor of Syria and Palestine, associated in many instances with starvation oedema. Appearing usually in the late spring after the rains had ceased the lesion would commence as a small itching papule which very soon became extremely painful as it assumed a dusky red and later a black colour, to break down in a few days to form an ulcer with a sloughing surface and elevated edge. Spreading rapidly, with a foul discharge of sanguineous rather than purulent material, the very sensitive ulcer, usually round but occasionally oval, might reach a diameter of 3–10 cm. in a week or less. The lesion was not a deep one and rarely penetrated to the bone. Usually of single occurrence the most frequent sites of the ulcers were the legs, ankles and feet, also hands and forearms, and only rarely above the knees and elbows. No cases were recorded with the trunk or face affected. Scraping from the edges revealed "a fusiform bacillus that resembled the diphtheria bacillus in shape, but which stained quite differently; with it there was always a symbiotic spirillum." The mode of infection was not determined, nor the host or carrier. No specific treatment is recommended.

W. J. O.

TOURNIER (E.). **Le traitement de l'Ulcère phagédénique des pays chauds par les injections sous cutanées de novarsénobenzol.**—*Bull. Soc. Path. Exot.* 1922. Dec. 13. Vol. 15. No. 10. pp. 926–930. [1 ref.]

The subcutaneous single injection of 0·30 cgm. novarsenobenzol in 4 per cent. sodium chloride solution is recommended as the therapeutical method of choice for such conditions based on the observations of 36 cases so treated. The subjective and objective improvement in 3–7 days following the injection is compared with that obtained by other methods. Locally an application of iodoform powder is employed.

W. J. O.

ABRAHAM (R. B.). **A New Treatment for Naga Sore.**—*Indian Med. Gaz.* 1923. Oct. Vol. 58. No. 10. pp. 479–480.

For this chronic ulceration—most commonly of the lower limbs and of undetermined etiology [see this *Bulletin,* Vol. 19, p. 168]—occurring sometimes in epidemic form in tea gardens intravenous injections of antimony tartrate are recommended. As a local application the writer has obtained satisfactory results with a solution [strength not stated] of calx chlorinata.

W. J. O.

VAN NITSEN (R.). **Un cas d'ulcération phagédénique de la face.**—*Ann. Soc. Belge de Méd. Trop.* Brussels. 1922. Dec. Vol. 2. No. 2–3. pp. 133–134. With 1 plate.

Report of a rapidly fatal case of phagedenic ulceration of the face, which commencing about the carious incisors spread in the course of 12 days to destroy the whole upper lip and to attack the cheeks and nose, the cartilage and bones of the nose and superior maxilla. Two injections of neosalvarsan exercised no effect. Fusiform bacilli and spirilla were found in the pus. The differential diagnosis of espundia and gangosa is discussed, and the possible relation of this case to one of noma.

W. J. O.

i. RANDALL (Alexander), SMALL (James C.) & BELK (Wm. P.). **Tropical Inguinal Granuloma in the Eastern United States.**—*Jl. Urology* 1921. Vol. 5. No. 6. pp. 539-548.
ii. ——, —— & ——. **Granuloma Inguinale.**—*Surgery, Gynecol. & Obstetrics.* 1922. June. Vol. 34. No. 6. pp. 717-739. With 22 figs.

i. Eleven cases (8 male, 3 female) have been under the observation of the authors, while four other cases had been reported to them. The disease is no new one to Philadelphia. The histological pictures of four cases examined showed proliferation of the fibrous tissue with considerable numbers of polynuclear leucocytes and endothelial cells, and proliferation of the squamous epithelium which was in one case such as to suggest an epithelioma. The staining and cultural characteristics of the granuloma organisms and their pathogenicity are described. Clinically the lesion was a granuloma. While some destructive action was obviously present there was no eroding, undermining necrotic base characteristic of an ulcer. With one exception, which was probably a case of double infection and did not respond so readily to treatment, all the cases occurred in negroes. Treatment with intravenous injections of tartar emetic gave uniformly good results. The main features of the cases observed and their course are presented in tabulated form.

ii. This is an elaboration of the previous paper, the number of cases being raised to 16, which are reported in some detail. The disease has been endemic in Philadelphia for the past 50 years and has been recognized, though improperly diagnosed for 25 years. The lesions have been confused with condylomata, tertiary syphilis, chancroidal sores and tuberculosis cutis. In this series the diagnosis was based in all cases on the presence of Donovan's encapsulated bacillus in and about the mononuclear cells in smears made from the lesions. The sparsity of other bacteria generally in these smears was remarkable. Animal inoculations with the encapsulated organisms from the granuloma lesions, compared with similar experiments carried out with Friedlaender's Bacillus from the throat, etc., showed no distinctive features. In only one of the cases reported were cultures from the granuloma lesions positive for Friedlaender's Bacillus. The most frequent site of the disease is the groin with quite frequent extension to the perineum and buttocks. The most destructive lesions occurred in males about the prepuce to cause erosion of the glans and shaft of the penis, while in females the labia majora suffered most and might become elephantine. The condition could extend into the vagina and rectum. The subjective symptoms as a rule were few, but most cases showed some secondary anaemia. Intolerance to tartar emetic administration was indicated by rheumatoid pains and stiffness of the joints especially on morning rising. Some good photographs illustrate the cases reported.

W. J. O.

GRUHZIT (O. M.). **Granuloma Inguinale.**—*Amer. Jl. Trop. Med.* 1923. July. Vol. 3. No. 4. pp. 289-295. With 1 fig. [3 refs.]

Two cases are reported from Columbus, Georgia. The first patient, a white female, had had an ulceration about the pudenda and perineum, with intermittent healing and relapsing, after an injury to the right groin four years previously. Smears from the ulcer showed no

Donovan bodies but many diphtheroid organisms. Healing took place under treatment by intravenous injections of tartar emetic following the administration of anti-diphtheritic serum. The second case was a male negro with an ulceration of seven months' duration at the base of the penis, from which smears revealed the presence of Donovan's bodies and " the fusiform bacillus and spirochetae of Vincent's angina." The specific granuloma organisms disappeared from the lesion with marked general improvement following intravenous tartar emetic medication, while the ulcer healed only after an injection of salvarsan.

Commenting on these two cases emphasis is laid upon the necessity of treating specifically any secondary infection occurring in this disease.

W. J. O.

GAGE (I. M.). **Granuloma Inguinale.**—*Arch. Dermat. & Syph.* 1923. Mar. Vol. 7. No. 3. pp. 303–325. With 11 text figs. [15 refs.]

This comprehensive account of the disease includes a detailed description of the histological picture of this " sclerosing granuloma." The vexed question of the nature of the causal organism is left undecided while the author favours the parasite described by DONOVAN, enclosed in the endothelial cells which are well figured in one plate. With regard to the differential diagnosis stress is laid upon the non-enlargement of the lymphatic glands. A Wassermann reaction should be performed in each case on account of the frequently accompanying syphilis. Treatment by intravenous injections of tartar emetic is recommended for all cases, while the urine must be carefully watched during the course of treatment especially in old subjects. Surgical removal, as an additional measure, is advised only for those cases where the lesions are readily accessible to such procedure. The importance of keeping all cases under observation for at least 12 months after healing is emphasized, as recurrences are not uncommon. Four cases are briefly reported.

W. J. O.

CNOPIUS (N.). **Some Communications concerning Venereal Granuloma in New Guinea.**—*Trans. 4th Congress of the Far Eastern Assoc. of Trop. Med.* 1921. Vol. 2. pp. 180–186. With 2 plates.

A brief account of granuloma inguinale occurring among the aborigines of New Guinea called " kaja-kajas." The number of cases treated is not stated. In all there had been obtained satisfactory healing with intravenous injections of antimony. Many cases had been of several years' duration, having been confused with syphilis and soft sore. The mode of introduction of the disease was not determined, but its sporadic enormous spread was due to the sexual abuses rampant among these natives.

W. J. O.

MANSON-BAHR (Philip). **Case of Ulcerating Granuloma of the Pudenda in which Healing commenced immediately subsequent to the Administration of Antimony.**—*Proc. Roy. Soc. Med.* (Clinical Sect.). 1923. Mar. Vol. 16. No. 5. pp. 25–26.

Report of a case which had been treated unsuccessfully during 13 months with anti-syphilitic remedies and with X-rays. The subsequent administration of 10½ gr. antimony tartrate injected intravenously combined with 7 intramuscular injections of oscol stibium had produced almost complete healing.

W. J. O.

SMALL (James C.) & JULIANELLE (Louis A.). **Biologic and Serologic Studies of** ***Bacillus mucosus*** **Group. Comparison of Strains from Granuloma Inguinale with Strains from Respiratory Tract.**—*Jl. Infect. Dis.* 1923. June. Vol. 32. No. 6. pp. 456–470. [12 refs.]

In the course of cultural studies of the lesions of inguinal granuloma encapsulated gram-negative bacilli were encountered. Cultures of strains of these indicated that they belonged to the Mucosus group found frequently in lesions of the respiratory tract. It was therefore thought desirable to compare strains of respiratory with those of granuloma origin. The morphology, biochemical reactions, inhibition of growth by tartar emetic and the serological reactions were studied. It was concluded that the respective strains could not thus be differentiated. The carbohydrate fermentation reactions were irregular and unreliable.

A. G. B.

MENDELSON (Ralph W.). **Xanthoma Tropicum (Juxta-Articular Nodules).**—*Jl. Trop. Med. & Hyg.* 1923. June 1. Vol 26. No 11. pp. 181–182. With 1 plate. [18 refs.]

A brief review of the history of the disease is followed by a short commentary on its aetiology. Having in no case been able to obtain positive cultural results, or positive inoculations in animals, the writer does not believe in the bacterial nature of the condition. Serum reactions did not suggest syphilis, nor had he been able to find the organism of yaws in sections or nodule juice. In his experience the nodules had not been observed above the elbows, while the commonest sites were the interior and lateral aspects of the lower parts of the legs. Secondary infection over irritated nodules could produce an ulcerated appearance. Microscopically the tumours appeared as fibromata with an abundant blood supply and a small round-celled perivascular infiltration. In older cases degeneration at first of a fatty nature, later with calcification and amyloid changes, had been observed. No tendency towards malignancy had been noted. The cause is assumed (by the author) to be some metabolic process at present undetermined. This short article is accompanied by useful illustrations.

W. J. O.

CANGE (A.) & ARGAUD (R.). **Les facteurs étiologiques des "nodosités juxta-articulaires."**—*Gaz. des Hôpit.* 1923. May 29 & 31. Vol. 96. No. 43. pp. 685–688. [8 refs.]

This brief, comprehensive and interesting review, containing numerous references, draws particular attention to a recent paper by v. DIJKE and OUDENDAL [this *Bulletin* Vol. 20, p. 288]. In criticizing the conclusions drawn by these writers, who have inclined to attribute the causal origin of the nodules to framboesia, Cange and Argaud consider that this work rather supports the view, which they themselves have maintained, of a syphilitic factor in the etiology of the lesions in question.

W. J. O.

PICOUT-LAFOREST (A) **Un cas de nodosités juxta-articulaires d'origine syphilitique chez un indigène du Sahara.**—*Arch Instituts Pasteur de l'Afrique du Nord* 1923 May Vol 3 No 2 pp 143-145 [8 refs]

Case report of an Arab, aged 35, with syphilitic lesions inside the mouth and with discrete nodules about both elbows and knees The nodules, non-adherent to the skin while apparently in some attachment to the deep aponeurosis, were of one year s duration The association of these tumours with the syphilitic lesions on the buccal mucosa and the simultaneous disappearance of both types of lesions under combined mercury novarsenobenzol administration were facts in favour of their having one common specific causal origin

W J O

ARGAUD (R) & NINON (J) **Étude histologique d'un nouveau cas de nodosité juxta-articulaire.**—*Arch Instituts Pasteur de l'Afrique du Nord* 1922 Dec Vol 2 No 4 pp 465-468 With 3 figs [2 refs]

The patient was a male native of Laghouat, Algeria, aged 70 years, with a positive Wassermann reaction and with signs of old scarring about the forehead and right cheek The lesion was a tumour of 20 years duration at the level of the left elbow and had never caused any trouble Some years previously there had been a similar lesion on the right elbow this had broken down and become resolved, leaving only a small non adherent scar Under local anaesthesia the tumour was enucleated and found to be adherent to the periosteum below by dense fibrous tissue while it was free above and at the sides

Macroscopically, the lower half of the tumour consisted of dense fibrous tissue which became less resistant towards the surface the upper part showed an irregular cavity, with smooth thick walls, divided into smaller spaces and containing a yellowish viscid purulent fluid resembling that in a gumma Microscopically the perivascular plasma cells and giant cells few in number presented a condition suggesting necrobiosis The fibrous portion of the tumour with picric fuchsin gave the picture of a collagen nodule undergoing chondrogenous metaplasia The capillaries in the more fibrous parts of the tumour were obliterated, and in those areas with persisting signs of inflammation showed endothelial proliferation The syphilitic nature of these tumours is emphasized in the summary of the histological picture of sclerosis with softening found in this case

W J O

REMLINGER (P). **Un cas de nodosités juxta-articulaires observé au Maroc chez un Européen.**—*Bull Soc Path Exot* 1923 May 9 Vol 16 No 5 pp 346-347 [3 refs]

Clinical report of a Spaniard, aged 26, who had been 4 years resident in Morocco There was no history or sign of syphilis, he had had several attacks of gonorrhoea The tumours had developed insidiously about both elbow regions while he had complained during four months of pain in the shoulders and elbows on movement of these joints The lesion about the right epitrochlea region—of the size of a date—appeared of a fibromatous consistency and in some connexion with the periosteum, the tumour about the left olecranon region was larger and harder than that on the right elbow and was subcutaneous Both excision and anti-syphilitic medication were refused

W J. O

CLAPIER (P.). **Nodosités juxta-articulaires et Tréponèmes.**—*Bull. Soc. Path. Exot.* 1923. July 11. Vol. 16. No. 7. pp. 553–556. [5 refs.]

From the laboratory of Libreville, Gabun, is reported a case of a tumour of four year's duration situated below the right patella of a man of 27 years who had been affected since the age of 3 years with framboesia. The lesion, of the size of a small nut and movable on the underlying tissues, had ulcerated seven months previous to the patient's coming under observation, and had not healed. Situated in a similar position on the left leg, but about 1 cm. lower down, was a smaller hard subcutaneous tumour, movable on its under surface and not adherent above to the skin. Stained smears of the pus from the right sided lesion revealed numerous variously sized treponemata which were considered to resemble *T. pertenue*. Following six injections of novarsenol both tumours entirely disappeared, and there had been no recurrence when this patient was again seen five months later.

W. J. O.

MONTENEGRO (João). **Etio-pathogenia das nodosidades juxta-articulares.** [The Pathogeny of Juxta-Articular Nodules.]—*Bol. Soc. Med. Cirurg. de S. Paulo.* Brazil. 1922. Dec.; & 1923. Jan. & Feb. Vol. 5. 3rd Series. Nos. 10, 11, & 12. pp. 199–201.

——. **Etio-pathologia das nodosidades juxta-articulares.**—*Brazil Medico.* 1923. Apr. 28. Year 37. Vol. 1. No. 17. pp. 233-235. With 2 text figs.

A woman 29 years of age,, had suffered from an ulcer of the vulva which was regarded and treated as syphilitic. Five years later she developed juxta-articular nodules of the elbows, and two years subsequently of the knees. The Wassermann reaction was now strongly positive (it had not been tested at first); treatment with oxide of bismuth was instituted and acted specifically on the nodules. One of them was excised and showed microscopically a marked fibrosis with new formation of vessels and perivascular lymphocytic infiltration. No parasites were found and pieces stained by Levaditi's method did not show any spironemata. The author is of opinion that, if not the sole cause, syphilis is the most common etiological factor of juxta-articular nodules in Brazil.

H. Harold Scott.

ROSS (I. Clunies). *Notoedres cati*: **its Possible Transmission to Man.**—*Med. Jl. Australia.* 1923. Sept. 8. 10th Year. Vol. 2. No. 10. pp. 246–249. [9 refs.]

The parasite causing mange in the cat, *Notoedres cati*, differs from the Sarcoptes parasite of scabies in man and in other domestic animals in having the anus on the dorsal surface instead of terminal as in Sarcoptes. Typical burrows are not formed, the female laying her ova quite superficially in so-called "nests." The sites of predilection are the ears, forehead and neck, with less frequently occurring lesions on the paws and tail. The earliest lesions are small papules which soon show yellowish-grey crusting and the hairs fall out. Microscopical examination of the crusts in 10 per cent. potash reveals parasites and ova in varying stages of development. The transmissibility of the parasite to man and other animals is very briefly discussed. Following experiments on himself the author concludes "that though *Notoedres* is communicable to man, the infection is temporary and tends to disappear spontaneously."

W. J. O.

JOYEUX (Ch.). **Sur un cas de gale norvégienne en Afrique Occidentale.** —*Ann. Parasit. Humaine et Comparée.* Paris. 1923. June. Vol. 1. No. 2. pp. 167–169. [6 refs.]

Report of a case of Norwegian scabies in a native, observed in Kouroussa (French Upper Guinea). The thick crusted lesions were generalized over the whole body, especially marked on the limbs while sparing the scalp and nails and only slightly involving the face. The patient showed no signs of leprosy. Examination of the crusts in potash revealed numerous mites in varying stages of development and no fungoid elements. Following a brief commentary on the nature of the itch-mite causing the disease in question, the conclusion is drawn that this is the same parasite as concerns the ordinary scabies affection.

W. J. O.

MONTPELLIER (J.) & BÉRAUD (M.). **La filario-réaction chez les sujets atteints de "gale filarienne" (Onchocercose dermique).**—*Bull. Soc. française de Dermat. et de Syph.* 1921. June 9. Vol. 28. No. 7. pp. 344-346.

In this investigation only water-extracted antigens had given constant results and with non-heated sera. The reaction appeared to be a specific one; 90 per cent. sera gave a positive result, as also 50 per cent. sera of Senegalese not clinically affected. A certain proportion of these latter cases might, however, have been infected. In comparing these results with those of other workers the question is asked—Is the reaction one specific to infection by the *O. volvulus*, or does it concern an antibody occurring commonly in any nematode infection?

W. J. O.

SUTTON (Lyle A.) & MALLIA (William M.). **Malignant Melanoma in the Negro.**—*Arch. Dermat. & Syph.* 1923. Sept. Vol. 8. No. 3. pp. 325–343. With 7 text figs. [11 refs.]

The extreme rarity of pigmented tumours in the negro race is noted and the most likely origin of such tumours from a pigmented naevus often following trauma.

A detailed report is made of a negress aged 78, in whom the unusual pigmented skin condition had gradually spread upwards from the foot to involve in the course of six months almost the complete left lower limb.

W. J. O.

DE MAGALHÃES (P. S.). **A chamada botryomycose humana, granuloma telangiectasico-botryomycosis hominis, granuloma pyogenicum.** [So-called Botryomycosis.]—10 pp. With 2 text figs. 1923. Sept. Typ. Revista dos Tribùnães–Carmo, 55.

The condition is easily recognizable: a rounded tumour varying in size between that of a pea and that of a filbert, red in colour, with a finely granular surface, sometimes raspberry-like, readily bleeding, occasionally superficially ulcerated, usually pedunculated, having the characters of a benign tumour, and affecting particularly the fingers, or hands, and the free edges of the lips. Its pathology, however, is a matter of dispute and the author suggests that it is a telangiectatic neoplasm or granuloma analogous to the ordinary naevus.

H. Harold Scott.

JOJOT & LAIGRET. **Un cas de tumeurs superficielles multiples observé au Cameroun.**—*Bull. Soc. Path. Exot.* 1922. Dec. 13. Vol. 15. No. 10. pp. 956–958. With 1 text fig.

Report of an interesting case of multiple painless superficial tumours, in a native aged 30, varying in size from a nut to a lentil which were adherent neither to the underlying tissue, nor to the skin. About some of the tumours the skin showed hyperpigmentation and in some few instances an increase of the horny layer. On pressure there was some tenderness. In all 493 tumours were counted of which six were situated on the head. There was, in addition, an elephantiasic swelling of the hands and feet, the fingers and toes resembling radishes; tumefaction and ulceration on the left sole had occurred as a complication due to secondary infection. Histological examination proved the tumours to be of a typical malignant sarcomatous nature. Attention is drawn to the unexpected nature of the tumours which had been thought to be probably mycotic. (No mention is made of the primary lesion).

W. J. O.

NOEL (P.). **Tumeurs pseudo-éléphantiasiques congénitales de la nuque.** —*Ann. Dermat. et Syph.* 1922. July. 6th Ser. Vol. 3. No. 7. pp. 366–367. With 1 fig.

Case report concerning a negro of the Cameroons with a symmetrical distribution in almost a horizontal line at the base of the neck of three painless subcutaneous tumours dating from infancy. The largest outermost lesion on each side was situated above and to the inner side of the coraco-clavicular joint, and the smallest innermost lesion placed some 3 cm. from the mid-dorsal line. These tumours, non-lobulated and of elastic consistency, were freely movable on the underlying tissues while being definitely connected with the skin which was thickened over the lesions. No histological examination was made, but the tumours were presumed to be naevoid in type and of a fibromatous nature.

W. J. O.

NOËL. **Tache bleue congénitale, dite "Mongolique," chez les nègres africains.**—*Ann. de Méd. et de Pharm. Colon.* Paris. 1922. May–June–July–Aug. Vol. 20. No. 2. pp. 158–161.

This interesting note is put forward by the writer to induce other observers to investigate the frequency of this condition among African natives. He had examined 70 new-born infants and had found this dermal pigmentation in 47, or over 67 per cent. The difficulty of observing this peculiarity in the coloured races is emphasized, with the need of making the examination before the appearance of the natural epidermal pigmentation.

W. J. O.

ARCHIBALD (R. G.). **Erythrodermia Congenitale Ichthyosiforme in an Arab Child.**—*Jl. Trop. Med. & Hyg.* 1923. June 1. Vol. 26. No. 11. pp. 180–181. With 1 plate. [3 refs.]

Case report of an Arab girl, aged three, whose unusual skin condition had been observed since birth. The skin abnormality consisted of a generalized scaliness varying from a furfuraceous desquamation to thick plate-like scales accompanied by erythroderma, the only unaffected parts being the palms, anterior aspect of the neck and inner side of both thighs, while the flexures of the elbow and knee joints were only slightly involved.

The soles showed hyperkeratosis, the palms hyperidrosis and erythroderma without scaling. Generalized anidrosis otherwise. The eruption on the extensor and lateral aspects of the forearms was lichenoid in appearance. The toe nails were brittle and fissured, the finger nails unaffected. "The scalp was very seborrhoeic, but the growth of the hair was not affected." The blood showed eosinophilia 17 per cent., without any evidence of worm infection being found in the faeces.

W. J. O.

HUDELLET. **Lesions osseuses dans l'ainhum (étude radiologique).**—*Congrès de la Santé Publique et de la Prévoyance Sociale, Marseille, 11–17 Septembre, 1922, Comptes Rendus.* pp. 157–163. With 4 text figs.

An interesting description with photographs of the radiological appearances of the toes affected in ainhum, in which condition the picture varies, according to the stage of the evolution of the disease, from that of a condensing osteitis to one showing resorption at the level of the furrow, on the distal side of which the calcium salts are slowly lost. This appearance is contrasted with that of a rarefying osteitis previously associated by SALANOÜE-IPIN with ainhum, and with the appearances observed in cases of nerve leprosy.

W. J. O

i. ARCHIBALD (R. G.). **Lichen Planus Hypertrophicus in the Sudan.**—*Jl. Trop. Med. & Hyg.* 1923. June 1. Vol. 26. No. 11. p. 179. With 1 plate.

ii. PUSEY (William Allen). **Lacquer Dermatitis.**—*Arch. Dermat. & Syph.* 1923. Jan. Vol. 7. No. 1. pp. 91–92. [3 refs.]

iii. CORSON (J. F.). **A Case of Creeping Eruption in a European in the Gold Coast.**—*Ann. Trop. Med. & Parasit.* 1923. Apr. 18. Vol. 17. No. 1. pp. 1–3. With 1 plate. [44 refs.]

iv. SHATTUCK (George Cheever). **Granuloma Inguinale in Boston.**—*Boston Med. & Surg. Jl.* 1923. Apr. 12. Vol. 188. No. 15. pp. 530 532.

v. WEIDMAN (Fred D.). **Certain Dermatoses of Monkeys and an Ape. Pemphigus, Scabies, Sebaceous Cyst, Local Subcutaneous Edema, Benign Superficial Blastomycotic Dermatosis and Tinea Capitis and Circinata.**—*Arch. Dermat. & Syph.* 1923. Mar. Vol. 7. No. 3. pp. 289–302. With 7 text figs. [12 refs.]

vi. DE KORTE (W. E.). **A Paramycetoma (?) of the Forearm.**—*Jl. Path. & Bact.* 1923. Apr. Vol. 26. No. 2. pp. 189–192. With 1 plate. [2 refs.]

vii. CRAIK (R.). **Acladium Castellanii (Pinoy).**—*Jl. Trop. Med. & Hyg.* 1923. June 1. Vol. 26. No. 11. pp. 184–185. With 1 text fig.

i. Report of a typical case with papular, linear and sclerose hypertrophic lesions. So far as the writer was aware no previous case had been noted in the Sudan.

ii. Case report of a dermatitis (papulovesicular) of the hands and forearms in a man handling small canes, from which an alcoholic extract of the varnish produced an inflammatory skin reaction when applied to this patient.

iii. Report of a case in which the causal parasite was not determined. A list of useful references accompanies this otherwise negative report.

iv. Three cases are reported in two of which the diagnosis is admitted to be uncertain, particularly that of a boy aged two years. In these two cases the lesions were apparently cured by surgical treatment alone. A list of cases previously reported from the United States is appended.

v. The title summarizes the contents of this paper, of interest only as a short contribution to the study of comparative pathology.

vi. The term paramycetoma is defined and the histological appearance of a tumour, removed from the forearm of a woman at the old site of an injury, is described in some detail to support the diagnosis so established.

vii. The cultural characteristics are described, and the alternative name of *Pseudomicrosporon castellanii* for this fungus is suggested.

W. J. O.

Neto (Vilas-Bôas). **Tinha da barba.** *Trichophyton crateriforme* **Sab. 1893.** [Sycosis due to *Trichophyton crateriforme.*] Reprinted from *Medicina Moderna.* Porto. No. 353. 16 pp. With 6 figs.

A case is recorded of a man, aged 26 years, suffering from sycosis from which the author cultivated on Sabouraud's medium the *Trichophyton crateriforme.* The condition had been present for more than a year.

H. Harold Scott.

Abelardo Lara (N.). **Las moscas y su papel en patologia.**—*Rev. Med. de Yucatan.* 1921. Dec. Vol. 12. No. 4. pp. 71–81. With 7 text figs.

Archives des Instituts Pasteur de l'Afrique du Nord. 1923. Vol. 3. No. 1. p. 98.—**Deux nouveaux cas de** *Xéroderma pigmentosum* **observés en Tunisie.**

Carrión (A. L.). **Observations on Dermatomycosis in Porto Rico.**—*Arch. Dermat. & Syph.* 1923. June. Vol. 7. No. 6. pp. 773 777. With 3 text figs.

Hoffmann (W. H.). **El Granuloma Venero en las Americas.**—Reprinted from *Sanidad y Benefic. Bol. Ofic.* 1921. Nov. Vol. 26. No. 5. p. 299.

Jiménez (J. B.) & Cuenca (H.). **Nota acerca de un caso de actinomicosis observado en Maracaibo.**—*Rev. Med. y Cirug.* Caracas. 1923. July 31. Year 6. Month 9. No. 64. pp. 183–186. (Discussion pp. 186–187.)

Mandal (Upendra Nath). **Streptococcal Affections of the Skin.**—*Indian Med. Gaz.* 1923. Aug. Vol. 58. No. 8. pp. 375–376.

Marulanda (Abel Echeverri). **Ulceras de las tierras calientas.**—*Repert. de Med. y Cirug.* 1921. Aug. Vol. 12. No. 11. (No. 143.) pp. 584–593.

Rodinò (Nicola). **I fagedenismi tropicala nella Somalia italiana.**—*Giorn. di Med. Milit.* 1922. Feb. 1. Vol. 70. No. 2. pp. 94–97. With 1 text fig.

Severiano de Magalhães (Pedro). **A chamada botryomycose humana, granuloma telangiectasico—botryomycosis hominis, granuloma pyogenicum.**—*Brazil Medico.* 1923. Aug. 25. Year 37. Vol. 2. No. 8. pp. 117–118.

Vaz (Luiz). **Algumas observações sobre o emprego do "aspir" no tratamento da syphilis e granuloma venereo.**—*Brazil Medico.* 1923. May 19. Year 37. Vol. 1. No. 20. pp. 279–280.

AMOEBIASIS AND DYSENTERY.

AMOEBIASIS.

JAUSION & DEKESTER. **L'amibiase à Fez.**—*Congrès de la Santé Publique et de la Prévoyance Sociale, Marseille, 11–17 Septembre, 1922. Comptes Rendus.* pp. 174–188. With 1 chart. [2 refs.]

It is said that Fez is a hot-bed of amoebic dysentery, 22·9 per cent. of the inhabitants being infected with *E. histolytica*. Unfortunately the paper is marked by some confusion in the nomenclature of the parasite. Under the term "Entamoeba dysenteriae" the authors distinguish a "tetragena" and a "minuta," as well as intermediary forms between *E. dysenteriae* and *E. coli*. They regard the occurrence of Charcot-Leyden crystals as infrequent in the stools of amoebic dysentery, and attribute their presence to gastric and pancreatic insufficiency. The general unhygienic condition of the native quarters of Fez is favourable to the spread of amoebic dysentery and is graphically described. In their search for healthy carriers they find that in the Mallah quarter the index is 7·69 and in Fez Medina as high as 22·9. Amongst the Arabs of Tafilalet and Sous the index is said to be as high as 45 per cent. The figures for hospital admissions show that 7·9 per cent. of European recruits, 4·8 per cent. of Arabs, and 9·7 per cent. of Senegalese are admitted for symptoms of the disease.

Amoebic dysentery is most common during the six months May to November. The authors have examined 79 animals of different kinds, including rabbits, guinea-pigs, cats, dogs, cows, asses, mules, horses, hens, and toads, for the presence of *E. histolytica*, with a negative result. Their experiments with flies have already been reported.

The rest of the paper contains clinical observations of little importance.

P. H. Manson-Bahr.

NORMET & SALLE. **Les dysenteries amibiennes à Fez.**—*Congrès de la Santé Publique et de la Prévoyance Sociale, Marseille, 11-17 Septembre, 1922. Comptes Rendus.* pp. 188-193.

Intestinal infections of all kinds, attributed to pollution of the water supply, are very common in Fez. Bacillary dysentery is not rare during the hot season. It begins by isolated cases without ascertainable epidemic foci, and does not appear to differ from this form of dysentery as seen elsewhere. During the month of September, at the end of summer, a series of infections are met with which may be termed coli bacillosis, in which the dysenteric syndrome is combined with an enteric-like fever with frequent attacks of hepatitis and, it may be, icterus. The colon bacilli are found in large numbers in the stools. The authors recognize spirillar dysenteries which are said to be due to the fusiform spirilla and bacilli of VINCENT, but they advance no evidence for this belief, except that they consider that this condition is curable by the ingestion of novarsenobenzol in capsules.

The chief form of dysentery in Fez is amoebic, and is said to be due to the organism in three forms—the large variety which ingests red blood corpuscles, the small which feeds on bacteria, and the cysts to which they allocate eight nuclei; they state that they have never seen a quadrinucleate cyst in Fez. They consider that the flagellates *Trichomonas intestinalis* and *Tetramitus mesnili* are not themselves capable of setting up dysentery, but may cause chronic irritation of the mucous membrane; on the other hand they consider that *Lamblia intestinalis* is pathogenic.

P. H. M-B.

JAUSION (H.) & DEKESTER (M.). **Sur la transmission comparée des kystes d'***Entamoeba dysenteriae* **et de** *Giardia intestinalis* **par les mouches.**—*Arch. Instituts Pasteur de l'Afrique du Nord.* 1923. May. Vol. 3. No. 2. pp. 154–155. [1 ref.]

Thirty-eight *Musca domestica,* one Stomoxys, two *Calliphora vomitoria,* fed for eight hours, at a temperature of 30° C., on stools containing *Entamoeba histolytica* and its cysts were killed in 5 per cent. formol: all that was obtained from them were a few amoebae in a very bad state of preservation.

Fifty *M. domestica* caught in the laboratory and ground up in serum did not yield any amoebae or cysts.

Twenty-three *M. domestica* and one *Sarcophaga magnifica* caught, some in the laboratory and some in the latrines, were equally barren of amoebae and cysts.

Fresh fly excrement did not contain parasites of any kind.

Forty-eight *M. domestica* and two *S. magnifica* caught in the latrines and killed in 0·9 per cent. serum kept at 37° C., injected into the rectum of a kitten, did not produce in the animal any effect visible in life or at necropsy

From these experiments which were made at Fez (lat. 34° 8′ N.) in the fly season, the authors conclude that the part played by flies in the spread of amoebiasis must be very small.

A. Alcock.

MAGGIORE (Salvatore). **Nota sulla dissenteria amebica nell'infanzia.** [Amoebic Dysentery in Children].—*Pediatria.* 1923. Sept. 1. Vol. 31. No. 17. pp. 913–921. [8 refs.]

Amoebic dysentery has been regarded as a rarity in Palermo, nearly all cases of dysentery there having been recorded as bacillary. The author gives details of seven patients, whose ages varied between six months and four years, all of whom suffered from acute amoebic dysentery. One child contracted the disease at the age of five months. All were treated with injections of emetine hydrochloride, the initial dose being ½ cgm., the subsequent doses 1 cgm. The results were not very satisfactory. One was cured, one greatly improved and left for the country, one, who was also tuberculous, improved to a certain extent only, one died, one still remained in hospital but was becoming worse, two were taken away by their parents and could not be followed up. The author concludes that the disease is by no means rare in Palermo now, and that the younger the child the worse the prognosis, since emetine appears to be less effectual with infants than with older children and adults.

H. Harold Scott.

RAZETTI (L.). **Los abcesos hepáticos.**—*Gac. Méd. de Caracas.* 1923. Mar. 15. Vol. 30. No. 5. p. 65.

The writer records that at the Vargas Hospital he has had to deal with only 21 cases of liver abscess during the nine years 1914–1922—one tenth of the number for a similar term prior to the introduction of emetine for the treatment of amoebic dysentery. To this the reduction in the number of cases is attributed. Of the 21, 13 were treated by ROGERS's method; 11 recovered, 2 died. The remaining 8 were successfully operated upon. [The figures given in the table are not quite correct].

During the first two months of 1923 there were three more cases. In one the abscess burst into the lung and the patient died.

H. Harold Scott

PICCOLI (Giovanni). **Un caso di ascesso epatico dissenterico a evoluzione toracica.**—*Ann. di Med. Nav. e Colon.* 1923. July–Aug. Year 29. Vol. 2. No. 1–2. pp. 1–11. [2 refs.]

A detailed account is given of an ex-soldier, 37 years of age, who suffered from an attack of dysentery (treated by injections of emetine) in Macedonia in 1917. Later in the same year the symptoms recurred to be succeeded almost at once by pain in the right hypochondrium. Emetine was again administered; the bowel symptoms cleared up but the liver trouble persisted. In spite of continued treatment with the drug an abscess developed and burst into the lung. Liver pus was expectorated for many months but the condition terminated in recovery without operative interference. The writer is of opinion that though the emetine did not prevent the development of the abscess the favourable issue may be ascribed to the use of the drug.

H. Harold Scott.

HARTMANN-KEPPEL (G. L.). **Vingt-deux observations d'abcès amibiens du foie, traités par l'émétine.**—*Rev. de Chir.* 1923. Vol. 42. No. 2· pp. 89–116.

In the 22 cases of amoebic hepatitis here carefully described, mostly from the Near East, the ages varied from 14–68 years. Eleven had developed hepatic abscess while suffering from dysenteric symptoms. In 17 cases there was a single abscess, in 3 cases two, and in 2 cases as many as five. In 16 they occurred in the right lobe of the liver, and in 6 in the left. The abscess pointed in 10 cases towards the thorax, and in 3 opened into the lung; in 5 cases it pointed into the abdomen, in 5 towards the costal margin, and in 1 case towards the lumbar region. The co-incidence of abscesses in other parts of the body was found in 4 cases—brain once, pancreas once, kidney once, and prostate once, all of which are said to have been of amoebic origin.

The death rate was 13 per cent. in this series. The onset was extremely variable; it was acute in 8 cases, subacute in a smaller number, insidious in 5, while in a single instance it provoked no symptoms at all.

In 7 cases the pain was in the region of the liver, in 3 it was referred to the right shoulder, and in 4 to the epigastrium; in 1 instance the point of maximum tenderness was over the appendix.

As regards the physical condition, in 5 it was extremely critical, in 12 it was serious, while 3 were in fair health, and 1 appeared to have no hepatic lesions at all.

For diagnosis radioscopy gave useful information in 6 cases, but in the remainder was of no service.

As regards the treatment, in 16 cases treated on medical lines with emetine and arsenic, ipecacuanha and arsenic, emetine and bismuth, the abscesses apparently disappeared. In two cases surgical treatment was combined with medical. Emetine was given up to ·32 gm. weekly; the whole treatment lasted three weeks.

The 3 cases which died succumbed to dysentery and haemorrhage.

The author is of opinion that liver abscess is becoming rare owing to the general employment of emetine in the treatment of amoebic dysentery. He thinks the drug is of no use when the liver pus is infected with other organisms, and in this respect the bacteriological examination of the liver pus is important.

P. H. M-B.

PETZETAKIS. **La broncho-amibiase. Bronchites amibiennes pures sans abcès. (Présence de l'amoeba histolytica dans les crachats.)** —*Bull. et Mém. Soc. Méd. Hôpit. de Paris.* 1923. Aug. 2. 3rd Ser. Year 39. Vol. 47. No. 27. pp. 1229–1233.

The author draws attention to a peculiar bronchitis which is characterized, so he says, by the constant presence of *E. histolytica* and *its cysts* in the sputum. For some time past attention has been drawn to the extraordinarily favourable influence of emetine in cases of an abnormal type of bronchitis which is apt to follow amoebic dysentery. Two cases are quoted. In one the patient complained of haemoptysis and *E. histolytica* was found in the sputum after a prolonged search; all symptoms cleared up after intravenous injection of emetine.

The second patient was troubled with a muco-purulent sputum in which again the living amoebae and cysts were demonstrated, and this case also was cured by intravenous injection of emetine. These two cases, he considers, are examples of pure pulmonary amoebiasis without abscess formation.

The author considers that there can be no doubt about the identity of the amoebae, as the diagnosis was verified by CRENDIROPOULO. Reference is made to other cases of a similar nature recently noticed in this *Bulletin.*

P. H. M-B.

MANSON-BAHR (Philip). **Pulmonary Amoebiasis.**—*Lancet.* 1923. Sept. 22. pp. 599–601. With 3 charts. [15 refs.]

In this paper five interesting cases are recorded in detail. The first three are instances of pulmonary conditions resembling in many of their symptoms broncho-pneumonia or miliary tuberculosis, but failing to yield to the usual methods of treatment. Two of the patients were ex-soldiers who had suffered from dysentery, the third was a Lascar who gave no history of this disease nor exhibited any signs of it beyond slight thickening of the sigmoid. In view of the history of dysentery in the first two patients emetine injections and pulv. ipecac. were given with rapid and lasting benefit. Profiting by these experiences the writer employed similar treatment in the third case with equally fortunate results. In all three the temperature fell promptly to normal. There was no hepatic abscess in any of them. It is worthy of note that the second patient came into hospital for a relapse of amoebic dysentery and was treated with emetine bismuthous iodide ; a fortnight later the pulmonary symptoms appeared and yielded to injections of emetine, so that it would seem that the former drug was not able to ward off the pulmonary attack.

The other two cases recorded were instances of rupture of hepatic abscesses into the lung, one of which became secondarily infected with monilia.

H. Harold Scott.

TRABAUD. **Un nouveau cas d'amibiase pulmonaire pure, sans abcès du foie, guérie par l'émétine.**—*Bull. et Mém. Soc. Méd. Hôpit. de Paris.* 1923. Aug. 2. 3rd Ser. Year 39. Vol. 47. No. 27. pp. 1270–1273.

The publication of the paper of RAMOND, DENOYELLE and LAUTMAN (see this *Bulletin*, Vol. 20, p. 708) has stimulated the author to record a similar case. The patient was an Algerian suffering from bronchitis with an abundance of clear expectoration. Radioscopy revealed an encysted abscess at the base of the right lung about the size of an orange, apparently not connected with the liver. Intravenous injection of salvarsan was followed by haemoptysis and the expectoration of abundant purulent sputum, but the pyrexia resolved and all symptoms disappeared after the continuous daily injection of ·08 of a gramme of emetine. The author therefore considers that the abscess was amoebic in origin and that the amoebae gained entrance to the lung via the liver, following the lymphatic vessels through the diaphragm.

P. H. M-B.

PISSAVY (A.), BRÉGER & CHABRUN. **Abcès amibien du poumon.**—*Bull. et Mém. Soc. Méd. Hôpit. de Paris.* 1923. Aug. 2. 3rd Ser. Year 39. Vol. 47. No. 27. pp. 1265–1267. (Discussion pp. 1267–1268.)

In September 1915, the patient contracted dysentery on the French front. He suffered from relapses for the next two years, and was discharged as unfit owing to the involvement of the liver. In 1921 he was found to be suffering from amoebic dysentery and was treated on the correct lines. In January 1922, he suffered from pains in the right hypochondrium with the expectoration of purulent sputum. He was then suspected of tuberculosis and relegated to an asylum, though repeated examinations for the tubercle bacillus were negative.

The diagnosis was apparently cleared up by an X-ray examination which showed a conical shadow at the right base, apparently in connexion with the right lobe of the liver, while tubercular lesions were absent. Emetine therapy resulted in rapid resolution of the pulmonary signs, and cessation of the diarrhoea and pyrexia. The patient was restored to perfect health.

[There appears to be no satisfactory evidence in this case that the abscess in the lung was not actually in communication with a similar one in the right lobe of the liver]. P. H. M-B.

HINES (Laurence E.). ***Endameba histolytica* in Seminal Fluid in a Case of Amebic Dysentery.**—*Jl. Amer. Med. Assoc.* 1923. July 28. Vol. 81. No. 4. pp. 274–275. With 1 text fig. [3 refs.]

The first and only recorded instance of the localization of *Entamoeba histolytica* in the genital organs was made by WARTHIN (see this *Bulletin*, Vol. 19, p. 686). In the present case *E. histolytica* was found, during life, in the seminal fluid of a man suffering from chronic amoebic dysentery. There appears to have been little doubt about the genuineness of the intestinal symptoms; the faeces contained erythrocytes and active *E. histolytica*. At the same time he complained of pain in the perineum, and the seminal vesicles were found to be slightly enlarged and extremely tender. The semen collected after massage contained numerous pus cells, Gram-positive cocci, bacilli and amoebae similar to those in the faeces. Despite vigorous emetine treatment they persisted in the former situation, though absent in the latter.

> "No amebas with the active motility observed in the organisms in the feces were present, but large, granular, ovoid bodies, with spherical nuclei were observed to throw out pseudopodia of clear ectoplasm while the body itself remained stationary. In one instance, the pseudopodia were seen to envelop a spermatozoon. These bodies, like the larger ones found in the stools, contained erythrocytes, vacuoles and small granules. . . . The characteristic annular nucleus was not clearly observed in smears stained with iron hematoxylin, Giemsa stain and eosin methylene-blue."

The author regards this case as one of amoebic dysentery with amoebic metastasis in the seminal vesicles. [The figure (microphotograph) given in the text is not very convincing.]

P. H. M-B.

HINES (LAURENCE E.). **A Form of Polypoid Colitis as a Late Stage of Amebic Dysentery. Report of Case.**—*Jl. Amer. Med. Assoc.* 1923. July 7. Vol. 81. No. 1. pp. 12 13. With 2 text figs. [11 refs.]

In amoebic dysentery it is unusual to find the colon without gross signs of ulceration as in the present case, where the mucosa was covered with extensive confluent polypoid masses. No entamoebae were found in the faeces during life. [It is doubtful whether the bodies described as representing these parasites in sections of the bowel are not examples of phagocytic endothelial or plasma cells both of which, according to the description given, appear to have been abundant.]

P. H. M-B.

GALMOZZI (F.). **Sopra un caso di epatite con splenomegalia da amebiasi dissenterica.** [A Case of Hepatitis and Splenomegaly in Amoebic Dysentery].—*Riforma Med.* 1923. Aug. 27. Vol. 39. No. 35. pp. 825–827. [18 refs.]

The patient, a man, 36 years of age, suffered in 1917 from a severe attack of diarrhoea (12–14 actions daily with mucus and blood) which cleared up in a fortnight without treatment. He had a brief return of this in 1918. Three years later, in October, 1921 having remained well in the interval, he complained of lassitude and lost weight. On examination he was seen to be jaundiced; the liver was enlarged, extending to the level of the umbilicus, as was also the spleen. The urine contained bile pigments. There was a leucocytosis of 10,500 per cmm., of which 68 per cent. were polymorphonuclears. The Wassermann reaction was positive although syphilis was denied and there were no residual signs of any primary venereal lesion. Examination of the faeces yielded negative results as regards amoebae, flagellates, or helminth infection. The diagnoses suggested from time to time were Hanot's cirrhosis, Banti's disease, malaria, and syphilis. Salvarsan did not improve the condition and on December 23rd emetine was tried, 8 cgm. being injected daily, and sodium sulphate was given by mouth. Five days later examination of the faeces revealed amoebae both in the active and cystic forms. At the end of a week the general condition and the individual symptoms had vastly improved. Amoebae were found daily between December 28th and January 2nd, but not afterwards. A Wassermann reaction carried out on January 6th proved negative and by the end of February the spleen was no longer palpable and the liver extended only to one finger's breadth below the costal margin. The writer comments on the obscurity of the case and upon the provocative effect of injection of emetine in causing amoebae to appear in the stools.

H. Harold Scott.

MONGES (Jules). **Les suites intestinales éloignées de l'amibiase.**—*Congrès de la Santé Publique et de la Prévoyance Sociale, Marseille, 11–17 Septembre, 1922. Rapports.* pp. 88–102.

Although the war has been finished for four years, a number of patients still suffer from dysentery. They complain at different times of their stomach, intestines, or liver, and some are thin, weak and anaemic. As a rule they have been thoroughly hospitalized. The author summarizes the different conditions of which these patients may complain.

Diarrhoea.—This may be of three types: (1) the mucous colitis type; (2) chronic enteritis type, and (3) the rectal muco-purulent type.

The first, the mucous colitis, is the most frequent. As a rule the patient is in good general condition, has a good appetite and digests his food well, but complains of intestinal pain. On the least indiscretion of diet he suffers from an acute diarrhoea, usually in the early morning, accompanied by colic and borborygmi; the stool is dark and bilious, sometimes green, with specks of mucus. The diarrhoea may be prandial, that is, may occur in explosive fashion immediately after a meal. Examination of the abdomen reveals nothing but slight tenderness on pressure, and the patient often suffers from secondary nervous manifestations.

(2). The chronic enteritis type.—As a rule this greatly affects the general health and may be very chronic, having lasted in one case for 18 years. The patient often has a yellowish or icteric tint. The abdominal pain is seldom intense, but may be paroyxsmal and localized to the hepatic flexure or right iliac fossa. Diarrhoea usually alternates with constipation; the stools are large and soft, and contain blood and mucus. The tongue is furred: some patients show gastric disturbances with frequent vomiting. The abdomen is generally flattened and easily palpated, and the large intestine can be made out throughout the whole of its course, especially at the sigmoid and hepatic flexures. The stomach is usually dilated. Cases of this description are often seen amongst French Colonials, who have returned to their country to die, having taken all sorts of remedies.

(3). The rectal muco-purulent type.—These patients exhibit the symptoms of rectitis, with the excretion of muco-pus. They usually are cases of unrecognized amoebic dysentery beginning with diarrhoea; the symptoms are localized in the lower part of the intestinal canal. The stools are frequently accompanied by tenesmus and a sense of burning pain. They have usually been ill for several years and exhibit various nervous symptoms.

Constipation.—Constipation may occur in three different forms, chronic habitual constipation in which continual laxatives or enemata are necessary; muco-membranous constipation, accompanied by the passage of desquamated mucous membrane; and the dry recto-colitis form, diagnosed only by sigmoidoscopic examination, when the mucous membrane is seen to be dry and lustreless. The indications for treatment are laxatives plus emetine.

Gastro-intestinal dyspepsia.—Many people who have suffered from amoebic dysentery have trouble in the digestive tract, generally due to displacements of the intestinal tube. They may complain of either gastric or intestinal symptoms and of constipation and diarrhoea. They nearly always have neurotic symptoms, or it may be disturbances of the vasomotor system, headaches, blushings, or palpitations.

Intestinal haemorrhage.—This may be in small or large amount. Examination of the rectum shows absence of haemorrhoids, but, as a rule, the mucous membrane is very sensitive and there is usually spasm of the anus.

Appendicitis.—Symptoms of appendicitis may be due to amoebic ulceration of the neighbouring organs, or to an ulcer of the appendix itself. Such a case in an African native is quoted.

Stenosis of the intestine.—This rare condition is due to the cicatrization of amoebic ulcers which may involve all the coats of the intestine.

Fibrous tumours of the gut.—These tumours, which often develop in the colon, are of amoebic origin. They are sometimes mistaken for tubercular tumours, but can be distinguished easily on microscopic section.

Tuberculous enteritis.—Tuberculous ulceration of the gut can be grafted upon amoebic enteritis. It may or may not be secondary to pulmonary tuberculosis.

The true nature of these clinical manifestations must be verified by other investigations. On searching for the parasites several possibilities may arise: (1) one may not find any parasite; (2) one may find the cysts alone, or (3) in association with other parasites such as flagellates, the spirochaetes, or the eggs of ascaris and trichocephalus; (4) no amoebic cysts may be present, but the other parasites mentioned may be abundant.

The intestinal functions can be studied by investigation of the faeces, when undigested meat and vegetable fibres may be encountered. Radiography gives some idea of the muscular functions of the gut, or of intestinal adhesions, or stenosis. The sigmoidoscope generally reveals most interesting information: (1) the mucous membrane may appear normal; or (2) chronically congested and covered with glairy mucus; or (3) ulcerated, when the typical amoebic lesions may be recognized; (4) the dry recto-colitis already mentioned may be discovered.

All these conditions persist unless specifically treated. The author considers that to deny emetine except to patients with amoebae or cysts in their stools, is not good practice; one should exhibit it in any case with obscure intestinal symptoms not explicable on any other basis.

P. H. M-B.

PETZETAKIS. **L' "amibiase rénale." Un cas de néphrite amibienne. Action curative et diurétique de l'émétine.**—*Bull. et Mém. Soc. Méd. Hôpit. de Paris.* 1923. Aug. 2. 3rd Ser. Year 39. Vol. 47. No. 27. pp. 1233–1235.

In course of researches on amoebic bronchitis the author has elaborated a method for the examination of the urine for amoebae, and records one case in which he thinks these organisms were the cause of a nephritis. The case was a man 50 years of age who had suffered from dysentery and whose urine showed casts, both granular and haemorrhagic, indicative of a subacute nephritis, and, in addition, active entamoebae containing red cells, and more rarely cysts. The patient suffered from polyuria and oedema. He is said to have entirely recovered on emetine treatment, which the author believes has a definite diuretic action.

P. H. M-B.

GORDON (R. M.). **The Treatment of Amoebic Dysentery.**—*Ann. Trop. Med. & Parasit.* 1923. Oct. 13. Vol. 17. No. 3. pp. 381–387. [2 refs.]

The author treated 150 cases of amoebic dysentery in the tropical ward of the Royal Infirmary, Liverpool, and kept them under observation for 1–6 months. (1) The initial diagnosis was made by the finding of motile entamoebae containing red blood corpuscles in the faeces. (2) Such a patient was considered to have relapsed when after completion of treatment diarrhoea recurred, and active entamoebae were observed in the stool. (3) Cases which after treatment continued to pass *E. histolytica* cysts unaccompanied by motile entamoebae were not considered to have relapsed. (4) Once a patient had relapsed he was considered as a fresh case and any other course of treatment was placed under a separate entry.

In the course of treatment, and for the first fortnight after, the stools were usually examined twice weekly; during the remainder of the observation period the examination averaged once a fortnight.

Amongst the 150 cases observed, 101 or 66 per cent. relapsed, but only 6 were observed to be passing *E. histolytica* cysts after treatment. Sixteen cases were given emetine periodide 6 grs. daily, and of these 8, or 50 per cent., relapsed within one month. The administration of this drug in gelatine capsules was found to be unsatisfactory as they frequently passed through the gut without dissolving, but when the periodide powder was given mixed with a little milk it did not produce vomiting.

A limited number of cases have been treated with Yatren as recommended by MUHLENS and MENK. The drug is given by the rectum for 8–14 days on end and repeated after a week's rest A seemingly satisfactory result was obtained on a patient who had resisted all forms of treatment for five years. The organism disappeared from the faeces and there was a reduction in the number of the stools, but unfortunately the patient relapsed one month later.

P. H. M-B.

RALLI (A.) & PANAYOTATOU. **L'emploi de l'émétine dans le service de la consultation externe de l'hopital hellénique d'Alexandrie (Egypte).**—*Presse Méd.* 1923. Aug. 29. Vol. 31. No. 69. pp. 742–744. [2 refs.]

These observations have been made upon patients of all nationalities, principally Greeks. The last ten years the authors have given as many as 20 injections of emetine daily during the summer months. The brand employed was that of Burroughs, Wellcome & Co.

As regards amoebiasis, two classes of cases are dealt with: (1) primary cases of dysentery, and (2) those which have become chronic either through carelessness, or incomplete treatment. The great obstruction to efficient treatment is that, owing to the therapeutic action of the drug, the patients cease to attend after the third or fourth day; it is usual to give 6·5 to 8·5 centigrams at one injection.

The authors are rather exceptional in considering that cases of amoebiasis can be cured by a series of 6–7 injections given every other day of 4 cgm. at a time, and that the disappearance of symptoms is much more important than the microscopic examination of the stools. Novarsenobenzol and other derivatives of salvarsan are considered to be supplementary in action to emetine.

As regards amoebic hepatitis the authors are of the opinion that, if emetine is promptly applied, the formation of liver abscess can be prevented. As direct evidence they quote the statistics which have already been published showing that before the introduction of emetine a total of 20–40 abscesses of the liver were operated upon, and now only 3–5. Hepatic complications are seldom seen in children, but on them also emetine has a remarkable effect. In their case 1½–3 mgm. is considered a proper dose.

A form of pseudo-appendicitis is recognized as being due to latent ulceration of the caecum. Haematuria is considered as another manifestation of amoebiasis; on what grounds, is not clear, while the drug is said to have been of very considerable use in checking the haemorrhage of urinary schistosomiasis. It is not suggested that the drug kills the adult trematodes in the same way as tartar emetic. The drug is of importance also in haematuria of other origin; four conditions in which emetine acts favourably are said to be chronic congestion of the liver, catarrhal jaundice, the hepatic congestion of malaria and haemoptysis.

P. H. M-B.

MATTEI (Charles). **Les données actuelles sur l'emploi de l'émétine dans l'amibiase.**—*Congrès de la Santé Publique et de la Prévoyance Sociale, Marseille, 11–17 Septembre, 1922. Rapports.* pp. 103–127. [35 refs.]

This is a monograph on the subject of emetine and especially of its chemistry.

Although regarding this drug as a specific for the acute stages of amoebic dysentery, the author considers that it has little or no action on the cysts, which are protected by their resistant envelope. For the intestinal canal it should be replaced by emetine bismuth iodide. intravenous injections, he considers, are dangerous and useless. When given by rectal injections emetine is apt to cause a recrudescence of the symptoms and may provoke an acute attack of amoebic dysentery.

He considers the drug especially efficacious in amoebic hepatitis and so convinced is he of its specificity that he thinks the therapeutic test may be used to diagnose hepatitis of amoebic origin.

P. H. M-B.

ROUX (F.). **Treatment of Amoebic Dysentery by Injections of Total Ipecacuanha.**—*Trans. Roy. Soc. Trop. Med. & Hyg.* 1923. June 21. Vol. 17. No. 3. p. 213.

The disadvantage of the use of emetine in amoebic dysentery is that the cure is of short duration. The author therefore utilized a hypodermic injection of total ipecacuanha which has given excellent results in Madagascar where it is put up in ampoules containing 20 cgm to 1 cc. of liquid. In severe cases two are injected per diem and at the same time rectal enemata of Tochlorine of 5-10 grm. in a litre of water are given twice daily. After four or five injections the patients evacuate fragments of intestinal mucosa containing amoebae. In cases of tenesmus pills of benzylbenzoate and benzaldehyde are used, each containing 25 cgm. of these substances.

The author says it is not necessary to continue treatment beyond four or five days, and none of his cases has relapsed.

P H M-B.

MENK (W.). **Nuevas observaciones acerca del tratamiento de la disentería amibiana.** [The Treatment of Amoebic Dysentery.] —*Rev. Méd. de Hamburgo.* 1922. Vol. 3. No. 8. pp. 237-238

Yatren (Behring-Werke) was employed in the treatment of 17 patients suffering from chronic amoebic colitis who had proved resistant to emetine and other drugs. The dose for adults is 3-6 gm., per rectum, in 200 cc. of water at 80° C., and should be retained as long as possible. If rectal administration is contra-indicated the drug may be given by mouth, 1 gm. three times a day. It is given daily for 6-8 days and after an interval of 3 6 days repeated; this is maintained for five or six weeks.

Three of the cases were uninfluenced; in others the amoebae rapidly disappeared, but in two instances returned "after a time"; two developed an abscess of the liver, one of which ruptured into the lung, but both recovered with further treatment by Yatren and without operation.

Yatren can be given with emetine and the author recommends that six doses of the former, 0·5 gm. each, be taken by mouth for two or three days with injections of the latter, then alternating periods of Yatren and emetine, and concluding with the former alone. The details of the duration of these latter treatments are not stated.

H. Harold Scott.

i. DE LANGEN (C. D.). **Yatreen in de behandeling der Amoebendysenterie.** [Yatren in the Treatment of Amoebic Dysentery.]—*Geneesk. Tijdschr. v. Nederl.-Indië.* 1923. Vol. 63. No. 3. pp. 442-447.

ii. LICHTENSTEIN (A.). **De behandeling van Chronische Amoebiasis met Yatreen.**—*Ibid.* No. 4. pp. 612-619. [2 refs.]

i. Reports on 36 cases (21 chronic, 10 relapses of known chronic cases, 4 acute attacks and 1 amoebic liver) treated with yatren with very satisfactory results from clinical as well as from parasitological point of view. Apart from the diarrhoea it causes, the treatment is well borne. A varied light diet during the cure is recommended.

ii. Four cases are quoted, one with complete clinical and protozoological success, one with clinically good results, but possibly failure from the etiological point of view, one with complete failure of the cure and one in which the cure had to be interrupted on account of the untoward symptoms caused by the drug. The author asserts that equally good results may be obtained by internal administration of neosalvarsan (which is much cheaper) and warns against exaggerated expectations of the effect of yatren.

W. J. Bais.

NOGUE & LEGER (M.). **Essais de traitement de la dysenterie amibienne aiguë par le Stovarsol.**—*Bull. Soc. Path. Exot.* 1923. July 11. Vol. 16. No. 7. pp. 557–559.

Stovarsol in the treatment of dysentery was introduced by MARCHOUX. It is put up in cachets of ·25 grammes, and latterly the authors have been treating acute cases of amoebic dysentery in natives with this drug. The doses which they have given are larger than those recommended by MARCHOUX, *i.e.*, 29 cachets in a period of 13 days, with a break on the 4th, 8th and 12th days. The patients received no other treatment whatsoever.

The three cases reported, all of whom had blood-and-mucus stools containing *E. histolytica*, did well, although the first relapsed nine days after treatment, and had to be subsequently treated with emetine.

The difficulty in assessing the value of stovarsol lies in the fact that in negroes, according to observation, amoebic dysentery tends to recover spontaneously.

P. H. M-B.

JACHONTOFF (I. E.). **Cuprum kalium cyanatum bei Amoebendysenterie.**—*Rev. Microbiol. et Epidemiol.* Saratov. 1923. Vol. 2. No. 1–2. In Russian, pp. 24–26. Abridged Version in German, pp. 89–90.

In recent years salvarsan and emetine have been unprocurable in Russia; recourse was therefore had to other substances. The potassium cuprocyanate in doses of 0·01–0·02 gm. in 10–20 cc. of a 0·85 per cent. NaCl solution was given intravenously every third day. No ill effects were observed, but in cases complicated with pulmonary tuberculosis a rise of temperature invariably took place. Altogether 9 cases of amoebic dysentery were treated in this manner, 5 chronic and 4 subacute; the former were completely cured and were kept under observation for a year. The improvement in the acute cases was marked; the entamoebae disappeared from the stools and at the same time the patient increased in weight and experienced a sense of well-being.

P. H. M-B.

BERCOVITZ (Nathaniel). **A Comparison of the Cysts of** *Endamoeba coli* **and** *Councilmania lafleuri* **in Congo Red.**—*Univ. California Public. Zool.* 1923. Feb. 1. Vol. 20. No. 15. pp. 365–371. [2 refs.]

In the course of an investigation of the receptivity of living cysts of intestinal Protozoa to various aniline stains the author noticed that of the species of living cysts coming under observation—*Entamoeba histolytica, Endolimax nana, Iodamoeba buetschlii, Chilomastix mesnili, Giardia intestinalis, Entamoeba coli*, and the organism described as *Councilmania lafleuri*—all were impermeable to stains except *Entamoeba coli* and *Councilmania*, living cysts of which could take up the particular stain Congo red, though they did not always do so.

The susceptibility of these two to Congo red, however, was found to be variable, sometimes the Congo red had no effect on Councilmania cysts, sometimes it stained them deeply; occasionally it also stained *E. coli* cysts deeply, often both kinds of cysts took only a faint pinkish stain. The author therefore made an attentive and exact study of the living cysts in 100 cases, 39 "showing *E. coli* infection," 57 "showing Councilmania infection," and 4 with both, and found that of *E. coli* cysts 43·6 per cent. did not stain with Congo red and 56·4 per cent. did, and that of Councilmania cysts 15·7 per cent. did not and 84·3 per cent. did take the stain. [The author does not suggest any explanation of the phenomena but they rather support the view of those who regard Councilmania cysts as damaged cysts of *E. coli*]. The author, of course, made sure that the cysts were living.

A. A.

ROBERTSON (Andrew). **Note on a Case infected with** *Dientamoeba fragilis*, **Jepps and Dobell, 1917.**—*Jl. Trop. Med. & Hyg.* 1923. July 16. Vol. 26. No. 14. pp. 243–244. [2 refs.]

Case of a young women, brought up in South America and afterwards resident in Egypt and in India, who had been subject to intestinal disturbance all her life, had suffered from amoebic dysentery in India and since then from attacks of diarrhoea and tenderness along the course of the colon. Besides a fairly constant supply of *Dientamoeba fragilis*, the stools furnished *Blastocystis hominis* in profusion, Trichomonas, Chilomastix, *Endolimax nana*, and four species of Spirochaetes.

A. A.

FAUST (Ernest Carroll). **A New Type of Amoeba Parasitic in Man observed in North China.**—*Jl. Parasit.* 1923. June. Vol. 9. No. 4. pp. 221–226. With 2 plates. [5 refs.]

The amoeba here introduced to science was found, in northern China, in stools of four cases of dysentery. Three of the cases were acute, one was chronic. One of the acute cases was lower-class European, the other cases were native Chinese. In two of the acute cases this new amoeba was the only organism observed in the stools, in the other two it was found in company, in one instance with *Entamoeba histolytica* and *coli* and flagellates, in the other instance with *E. histolytica* only. The author considers it to be a new species and to represent a new genus, and gives the following summary of his paper :—

" *Caudamoeba sinensis*, nov. gen., nov. sp., a new amoeba from man is described.

" The organism is characterized by viscous endoplasm, thin layer of ectoplasm, antero-posterior polarity, lobose anterior and attenuate posterior end drawn out into a caudostyle, which is surrounded at times by a group of protoplasmic projections more or less conspicuous, a constant movement of the organism away from the caudal end, and a nucleus near the anterior end of the body with minute chromatin granules just within the nuclear membrane, together with a karyosome specifically different from that of the described entamoebae of man.

" The organism . . . is phagocytic for red blood corpuscles and for bacteria and in two instances was the only micro-organism in the stool suspected of being pathogenic.

" Cases containing only this organism in the stools gave typical history and symptoms of amoebic dysentery.

" Emetine is a specific for the infection. The organism succumbs in the course of a few treatments and does not re-appear in the stool after a course of treatments. In this respect it is apparently more amenable to treatment than *Entamoeba dysenteriae*" [=*histolytica*.]

In the plates accompanying the paper, figures and photomicrographs are given of the active and quiescent amoeba and a figure of the precystic stage.

A. A.

MELLO (U.). **L'Amebiasi nei Primati.** [Amoebiasis in Monkeys.]—*Ann. d'Igiene.* 1923. Aug. Vol. 33. No. 8. pp. 533–552. With 2 plates [31 refs.]

It is already well known to all who have studied the subject that monkeys commonly harbour in their intestines two species of Entamoeba which are very closely similar to the two species of the same genus (*E. coli* and *E. histolytica*) which occur in man. Some workers believe, indeed, that the species found in monkeys are identical with those found in man; but others consider them to be distinct, and accordingly assign different specific names to them. [The present reviewer has summarized the literature on these organisms in his book on *The Amoebae living in Man* (1919), pp. 131–133, and has there pointed out that it is impossible, at present, to distinguish these amoebae of monkeys with certainty from *E. coli* and *E. histolytica*; but that if they should ultimately be shown to be distinct species, then the one resembling *E. coli* should be called *E. pitheci* Prowazek, 1912, while that like *E. histolytica* should be known as *E. nuttalli* Castellani, 1908.] The author of the paper under review has restudied the amoebae of monkeys and now gives us the results of his work in what he himself calls "a modest contribution" to the subject.

The author began his investigations in 1913 at the Pasteur Institute, Paris, in the laboratory of the late Prof. LAVERAN, and completed them, after the War, at Turin. At Paris he had a considerable material at his disposal, consisting of some 80 laboratory monkeys of various species; but the majority of his observations were made upon the faeces of 11 individuals of *Macacus cynomolgus*, 5 *M. rhesus*, 3 *M. sinicus*, 3 *Cynocephalus* [sp. ?], 2 *Cercopithecus patas*, one orang-utan and one chimpanzee—all of which were found to be specially well infected with amoebae. In addition, the author was able to make post-mortem examinations of the lesions in one *M. cynomolgus* and one *M. rhesus* which died suffering from amoebic dysentery.

Detailed findings from this series of monkeys are not recorded; but it appears that an amoeba closely resembling *E. histolytica* [*i.e.*, "*E. nuttalli*"] was found in *M. cynomolgus*, *M. rhesus*, *M. sinicus*, *C. patas*, and *Cynocephalus*, whilst an amoeba resembling *E. coli* [*i e.*, "*E. pitheci*"] was found "in 75 per cent. of the monkeys in the Pasteur Institute." In agreement with previous workers, the author found that the first species was sometimes pathogenic, giving rise to typical amoebic dysentery with characteristic ulcers in the large intestine, whereas the second species appeared to be non-pathogenic. The only real addition—but it is an important one—which he makes to our knowledge of these two species is recorded in the following experiments (p. 543):

"Dysenteric faeces" from *M. sinicus* [containing amoebae of the *histolytica*-like species] were injected intrarectally into two kittens: 15 and 19 days afterwards, respectively, these two animals displayed dysenteric symptoms, with large numbers of amoebae in their dejecta. The symptoms increased in severity until two months had elapsed since the inoculations were made. [At this juncture the author left Paris, apparently without ascertaining the final result of his experiment, though he is persuaded that the death of both kittens was then imminent.] Further, "dysenteric faeces" [from what species of monkey is not stated] were similarly injected into 5 rats: and within 20 days two of these died with "characteristic lesions" in the large intestine, and "numerous parasites in the focus of infection."

Unfortunately no further details of these experiments are recorded, but they appear to show that "*E. nuttalli*," like *E. histolytica*, can parasitize cats and rats as well as monkeys; and they thus supply further evidence of the close similarity—or maybe even identity—of these two species. The author quotes [though not always accurately, and sometimes profoundly erroneously—as when he states (p. 535) that KARTULIS observed a case of amoebic liver-abscess in an orang-utan at Manila in 1913 !] the observations of previous workers on the amoebae of monkeys, but he is evidently confused by the apparent discrepancies in their descriptions. He also says something about the amoebae of man: but here, too, he seems unable to feel his way among the conflicting evidence, and not unnaturally, therefore, he infers that our knowledge of all these organisms is still in a state of chaos. Nevertheless, he concludes that, "notwithstanding the uncertainties which still remain to be cleared up concerning amoebiasis generally," he is justified in assuming that the two species of amoeba which he has studied in monkeys are "perfectly identical" with "ameba coli" and "ameba dissenterica" [*i.e.*, *E. coli* and *E. histolytica*].

In addition to discussing the two species already mentioned, the paper contains an account of a "new species" of *Entamoeba*—called *E. multinucleata*—found in the faeces of an orang-utan (which was also infected with "*E. nuttalli*"). From the description, this organism appears to differ in no way from "*E. pitheci*," save in that it is said to form—in addition to the usual 8-nucleate cysts characteristic of this species—peculiar "multinucleate" cysts which subserve the purpose of schizogony. [Apart from six unconvincing figures illustrating this questionable process, the interpretation is supported only by a drawing (Pl. II, fig. 15) of what is manifestly merely a supernucleate cyst of *E. pitheci*: and it is evident that this "new species" has little to justify its introduction.]

In conclusion, the author notes that he has also found an amoeba belonging to the genus "*Wahlkamphia*" [? *Endolimax* sp. or *Iodamoeba* sp.] in "various species of monkeys"; a species of the genus "*Löschia*" [a synonym of *Entamoeba*] in *M. cynomolgus* and *M. rhesus*; as well as *Blastocystis* "in various monkeys" on frequent occasions. He also mentions incidentally (p. 548) that he found a *Trichomonas* in the faeces of an orang-utan.

[The author of this paper appears to have been hampered by an imperfect acquaintance with the science of protozoology; and though he makes many references to the works of others, his spelling of proper names is frequently at fault, and not seldom so wrong as to render his references unintelligible to anybody unversed in the literature. For example, while it is possible that many a reader may guess that "NOA," "TICKHORN," and "WEYON," stand respectively for NOC, EICHHORN, and WENYON, it is not everybody who will be able to recognize PROWAZEK and LYNCH under the designations of "TRAWAGECH" and "LEYNEH." These and numerous other minor misprints and errors mar much of what the author has to say, and often add to the difficulty of understanding and adequately appraising his findings.]

Clifford Dobell.

i. HUNG-SEE-LÜ. **Zur pathologischen Anatomie der Amöbenruhr.**—*Virchows Arch. f. Path. Anat. u. Physiol.* 1923. May. Vol. 243. pp. 478–508. With 10 figs. [52 refs.]
ii. CILENTO (R. W.). **Amoebic Dysentery in Australia.** [Correspondence.] —*Med. Jl. Australia.* 1923. July 7. 10th Year. Vol. 2. No. 1. p. 23.

i. This elaborate and well illustrated study of the pathology of amoebic dysentery is founded upon material collected on the Western front during the War, but adds little to our previous knowledge of the morbid histology of this disease.

ii. Points out that amoebic dysentery is probably widespread in Australia tending especially to occur in mining centres.

P. H. M-B.

BACILLARY DYSENTERY.

GUIMARAES (Aristides), LIMA (Moacyr de Souza) & PISA (Alarico de Toledo). **Dysenteria bacillar.**—*Brazil Medico.* 1923. July 21. Year 37. Vol. 2. No. 3. pp. 42–47.

In November 1921, 15 patients were admitted to hospital with symptoms of acute dysentery. All proved to be of the bacillary type and in each case the Shiga bacillus was isolated from the faeces on Endo's medium. The organism is described as motile, but very conclusive tests were carried out with it, not only cultural but also serological, inoculatory, and toxin preparation by the Neisser-Shiga and Conrad methods, followed by further inoculation tests with the toxin so obtained.

H. Harold Scott.

PAPAMARKU (P.) & STEENHUIZEN (S.). **The Epidemic of Bacillary Dysentery in the Dairi-Lands, 1921–1922.**—*Meded. Burgerlijk. Geneesk. Dienst in Nederl.-Indië.* 1923. Pt. 2. pp. 161–184. With 1 map and 7 charts. [39 refs.]

These observations were made in Sumatra, where a dysentery epidemic prevailed from November 1921 till October 1922, aggravated by the holding of a big fair attended by some 4,000 people. The region is mountainous for the most part and is watered by several rivers; it contains no roads, but only foot-paths. The population amounts to about 33,000 and consists of three groups which speak different languages, are very primitive in their habits, and much addicted to opium.

The epidemic is attributed to carriers of the bacilli, especially those showing chronic symptoms of dysentery; the author has been unable to trace any connexion between the outbreak and the water supply, but the uncleanly habits of the natives rendered direct infection from one person to another extremely easy. A tentative diagnosis of bacillary dysentery was made upon the cytological appearance of the stools. The epidemic reached its height in January 1922 with 108 cases, the morbidity rate being 2·44 per cent. In all 339 patients were isolated and treated. The Shiga bacillus was recovered only 8 times out of 20 examinations.

The greater part of the paper gives in detail the special sanitary measures employed, which are not of general interest. The best therapeutic results were obtained with the polyvalent dysentery serum at Weldtewreden. The mortality rate of patients injected with serum amounted to 11·5 per cent., a rate not thought to be high considering the great difficulty of transport, etc. The staying of the epidemic is attributed mainly to early isolation of freshly infected cases.

P. H. M-B.

BOURDINIÈRE. **Considérations sur le développement de la dysenterie épidémique au cours de l'année 1921.**—*Rev. d'Hygiène.* 1922. Nov. Vol. 44. No. 11. pp. 1034-1038.

Since the war epidemics of dysentery have occurred yearly in Brittany, appearing to extend from isolated centres, the starting point being attributable to some carrier of bacillus. The 1922 epidemic took origin at the beginning of August in a military camp, and its spread, as elsewhere, appeared to be controlled by changes in temperature, and ceased with the onset of frost and rain. The contagiousness of the infection appears to be specially remarkable and to be related to the prevalence of houseflies. The bacillary variety prevailed ; only one instance of amoebic dysentery, confirmed at autopsy, having been recorded.

Statistics regarding the morbidity from bacillary dysentery being imperfect, it becomes almost impossible to assess the mortality from this cause, though it is known that several families have lost three or four members. As a cause of death bacillary dysentery ranks next to tuberculosis. In view of the difficulty of enforcement of the necessary sanitary precautions, antidysenteric prophylactic inoculations both by the oral and subcutaneous route, appears to be the most practicable measure and is now being employed.

P. H. M-B.

BOLTON (J. Shaw) & MCGRATH (M. J.). **Asylum Dysentery and Allied Infections. (Fourth Post-War Report.)**—*The Ninth Annual Report of the Board of Control for the Year 1922. Lunacy and Mental Deficiency.* pp. 65–73.

This report gives an account of the work performed during last year at the West Riding Mental Hospital, Wakefield. As the result of the special measures employed, infections with dysentery bacilli are becoming increasingly rare. Of 116 specimens only 14 gave positive results, Flexner's bacilli being found in 7 cases, *B. proteus* in 4, and Morgan's bacillus No. 1 in 3. During the year the serum of 447 new patients was tested against Flexner's bacillus and *B. typhosus*; 40 agglutinated B. Flexner and 6 *B. typhosus.* The examination of post mortem material in 192 cases was singularly disappointing, Flexner's bacillus being obtained in one case only.

P. H. M-B.

REEVE (E. F.) & WATSON (G. A.). **Report on Dysentery for the Year 1922.**—*The Ninth Annual Report of the Board of Control, for the Year 1922. Lunacy and Mental Deficiency.* pp. 76–77.

In the Lancashire County Mental Hospital, Rainhill, there was an outbreak of diarrhoea affecting 90 patients, and the Y bacillus of dysentery was isolated in 19 males and 47 females. The epidemic which ceased as suddenly as it commenced was of a mild nature, so much so indeed that in the absence of microscopical examination the cases would not have been classed as dysentery. In three cases at a later period of the year infection with *E. histolytica* was discovered.

P. M. M-B.

LÖHLEIN (M.). [**Ueber die sogenannte follikuläre Ruhr.**] [The So-called Follicular Dysentery.]—*Veroffentlichungen aus dem Gebiete der Kriegs- und Konstitutions-pathologie.* 13 Hefte. Gustav Fischer, Jena. 1923. [Summarized in *Muench. Med. Woch.* 1923. Sept. 21. Vol. 70. No. 38. p. 1206.]

There has recently been a discussion whether dysentery begins in the follicular tissue of the gut. Some authors, notably Löhlein, believe that the dysentery bacillus does not primarily affect the follicles, but that they are invaded together with the rest of the mucous membrane. The characteristic button-hole ulcers of bacillary dysentery are formed as the result of suppuration, while the deep ulcers of amoebiasis and balantidiasis are caused by the local necrotic action of the several organisms.

P. H. M-B.

GARDNER (A. D.). **The Agglutination of Standard Agglutinable Cultures of the Flexner-Group of Dysentery Bacilli by Non-Dysenteric Human Sera.**—*Jl. of Hyg.* 1923. Aug. Vol. 21. No. 4. pp. 399–405. [16 refs.]

The degree to which the serums of healthy persons will agglutinate Flexner-group bacilli depends greatly upon the technique employed, and upon the sensitiveness of the strain cultivated. The figures recorded have ranged between 1 in 20 and 1 in 2,500. The results are here recorded of the degree to which standard agglutinable cultures of five serological Flexner-group bacilli are agglutinated by known dysenteric sera; certain of these cultures are more highly agglutinated by some normal human sera than was anticipated. There apparently is no limit above which a "normal" serum will be found not to react and the repetition of agglutination tests capable of measuring the fluctuation of agglutinins in active infections is the only safe scientific procedure. [For technical details this paper must be consulted in the original].

P. H. M-B.

IIJIMA (Tsunenori). **The Presence of Heterophile Antigen in Bacteria, with Special Reference to Shiga's Dysentery Bacillus—a Contribution to the Study of Forssman Antigen and Antibody.**—*Jl. Path. & Bact.* 1923. Oct. Vol. 26. No. 4. pp. 519–534. [12 refs.]

The contents of this technical paper may be judged from the conclusions:—

"i. *B. dysenteriae Shiga* contains heterophile (Forssman *) antigen, as is shown by the fact (*a*) that it exhibits the characteristic reactions with antisera containing Forssman antibody, and (*b*) that when injected into suitable animals, such as rabbits, it generates Forssman antibody.

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* *See Biochem. Ztschr.*, 1911, Vol. 37, p. 78.

"ii. The Forssman antibody contained in anti-Shiga immune serum derived from the rabbit is independent of the specific agglutinin, since absorption of the Forssman antibody by goat's red corpuscles leaves the agglutinin content of the serum unaltered.

"iii. Toxic effects following the injection of vaccines of Shiga's bacillus in certain cases may be of anaphylactic nature, since the serum in a certain proportion of human subjects contains a large quantity of Forssman antibody.

"iv. *V. cholerae*, *B. typhosus*, *B. paratyphosus B.*, and *B. gaertneri* do not contain Forssman antigen."

A. G. B.

BROKMAN (Henryk). **[Badania nad wrazliwoscia ludzi na jad czerwonkowy w zwiazku z zagadnieniem osobniczej odpornosci. (Recherches sur la sensibilité de l'homme à l'action de la toxine dysentérique en rapport avec l'immunité individuelle).]**—*Polska Gazeta lekarska.* 1923. June 3. Vol. 2. No. 22. [Summarized in *Bull. Inst. Pasteur.* 1923. Oct. 15. Vol. 21. No. 19. p. 765.]

The author has applied the Schick reaction to dysentery in man in the following manner: 0·1 cc. of Shiga dysentery toxin, in a dilution of 3 to 100, was injected under the skin. Contrary to what takes place in laboratory animals, a very considerable reaction is produced in man. At the end of 24 hours a diffuse red infiltration appears, gradually turning blue. When the reaction is stronger the skin becomes blue and afterwards deep brown; while at the end of a week an ulcer forms, sometimes with suppuration, but in the majority of cases there is only transient inflammation. All possible stages were observed in a series of 200 cases in which there were 80 per cent. of positives and 20 per cent. of negatives.

The reaction becomes negative after injection of anti-dysenteric serum. The author thinks that this reaction indicates the presence of anti-toxic bodies in the serum of people who give a positive reaction.

P. H. M-B.

i. GOEDBLOED (C. A. G). **Een geneesmiddel bij chronische bacillaire dysenterie.** [A Cure for Chronic Bacillary Dysentery.]—*Geneesk. Tijdschr. v. Nederl.-Indië.* 1923. Vol. 63. No. 3. pp. 481–484.

ii. ONO (Kōsaku). **[Vergleichende Untersuchung der Darmveränderungen durch die Infektion verschiedener Typen von** *Bacillus dysenteriae*.**]**—*Ni. Byor. Gak. K.* Tokyo. 1921. Vol. 11. pp. 406–408. [Summarized in *Japan. Jl. Med. Sciences.* Tokyo. 1922. Vol. 1. No. 1. pp. 68–69.]

i. Recommends a decoction (1 : 10) of *Caesalpinia sappan L.*, a tablespoonful every hour, as being easier taken and more effective than the usual astringents (simaruba, cortex granati, etc.).

W. J. Bais.

ii. Whether the different dysentery bacilli produce different pathological appearances in the gut has been an open question. The author therefore examined 24 cases of different infections, with the result that he found minor differences in the degree of oedema, hyperaemia, swelling of the follicles, and the appearance of the ulcers.

P. H. M-B.

MIXED AND UNCLASSED DYSENTERY.

CUNNINGHAM (J.). **Some Observations on Dysentery.**—*Indian Med. Gaz.* 1923. Aug. Vol. 58. No. 8. pp. 358–363. With 1 chart. [8 refs.]

In Eastern Bengal the author found 86·5 per cent. of his dysentery cases were bacillary in origin ; 7·7 per cent. were due to the *Entamoeba histolytica* and 5·7 per cent. to a mixed infection of bacilli and entamoebae. He is therefore convinced that the bacillary is by far the commonest type of dysentery met with in India, and it follows that the wholesale injection of emetine is no longer justifiable. The mixed infections he thinks are much commoner than was formerly believed. Bacillary dysentery, or jail dysentery, can be classified into the acute or fulminating, subacute, and chronic. The term " subacute " denotes merely a collection of symptoms ; it may refer to one attack only or numerous relapses. The term " chronic " dysentery is reserved for a very definite clinical entity which was formerly described as a separate disease by Norman CHEVERS, under the heading of *Morbus bengalensis*.

The acute dysenteries are usually due to Shiga's bacillus, but the great majority of cases in the endemic area, *i.e.*, 77·7 per cent., are subacute. In about 50 per cent. of these cases an attack of bacillary dysentery has preceded, and the symptoms of this form tend to disappear of their own accord, though they may be cut short by magnesium sulphate treatment. Post-dysenteric arthritis is rare in India ; on the other hand neuritis is a most definite complication. It may attack the arm or the leg, producing paraesthesia ; in one instance there was paralysis of the external popliteal nerve. Hepatic cirrhosis with ascites may supervene and has been ascribed to the toxins of the dysentery bacillus. Advanced cases of chronic bacillary dysentery are emaciated to an extraordinary degree. In one instance—an adult male Indian—the weight recorded was 58 lbs. ; death terminated in a semi-comatose condition with incontinence of urine and faeces. The stools are usually copious and diarrhoeic in character. Death may take place from inanition or from oedema, which does not appear to be cardiac in origin.

The term " latent dysentery " is reserved for those cases in which, although the patient appears to be in normal health, blood, mucus, and intestinal cells are found in the stools. These cases are liable to an explosion of clinical dysentery at any moment. In this connexion the author examined 3,460 individuals from four jails. In 411 cases, or 11·88 per cent., the faeces were found to have a dysenteric character, but by more frequent examinations, on ten successive days, the percentage of dysenterics was raised to 22·8. The proof that these were actual cases of bacillary dysentery in a latent stage is founded upon the fact that in 50 per cent. of cases examined by the sigmoidoscope actual ulceration of the rectum was found, while 24 per cent. latent cases noted passed through an acute attack of the disease in a period of observation of less than six months. Bacteriological examination of the stools of 68 individuals in the latent stage showed the bacilli of dysentery in 26·7 per cent.

These cases are important to the community because (*a*) they themselves tend to increase the incidence of the disease, and (*b*) they act as potential carriers.

It is suggested that by systematic microscopic examination of the stools and isolation of all potential carriers much may be done in the way of limiting the spread of the disease.

P. H. M-B.

DUFFAU (H. E.). **Dysenterie amibienne et dysenterie bacillaire associées.**—*Arch. Instituts Pasteur de l'Afrique du Nord.* 1923. May. Vol. 3. No. 2. pp. 151–153.

A report of two cases of intestinal amoebiasis with superimposed bacillary infection. The first appears to have been a chronic case with *E. histolytica* cysts; Shiga bacilli were isolated from the mucus of the stools and the patient recovered rapidly on serum treatment. The second patient had acute symptoms of amoebic dysentery with active forms of *E. histolytica*. During convalescence he seems to have contracted a bacillary infection and recovered after vigorous serum treatment. It was considered that in both these cases amoebiasis was the primary condition.

P. H. M-B.

MAITRA (G. C.). **Dysentery in the Colliery Areas. Five Months' Work in the Jheria Mining Settlement.** *Indian Jl. Med. Res.* 1923. July. Vol. 11. No. 1. pp. 296-304. With 1 chart. [13 refs.]

The majority of cases observed on these coal-fields were found to be bacillary in origin, and in light of our present knowledge ankylostomiasis, which is very prevalent, would appear to be the most important predisposing cause. Apparently classical dysentery forms only a very small proportion of the bowel diseases in this area. The stool cultures were positive in seven cases only. Flexner's bacillus was commoner than that of Shiga.

P. H. M-B.

ADACHI (Kiyohisa). [**Ueber die Ätiologie von "Ekiri."**]—*Fukuoka Ikw. Daig. Z.* 1921. Vol. 14. 45. [Summarized in *Japan Jl. Med. Sciences.* Tokyo. 1922. Vol. 1. No. 2. pp. 153–155.]

Ekiri is an acute disease of children which is especially common in the summer months in Fukuoka, where it is endemic. According to the author's researches the disease is a form of dysentery produced by a dysentery-like bacillus which has no flagella, produces no gas, but clots milk in two or three weeks. It was first isolated from the gut wall of a child dead of a rapid infection, and later from 17 other cases. Its pathogenicity is inferred from its discovery in the tissues and its serological reaction. The colonies resemble those of Flexner's bacillus, but are larger. It produces no indol in peptone water; in litmus the milk is first turned red, then blue, and later returns to the former colour. Injection of this organism into rabbits produces diarrhoea and paralysis of the extremities. The author is of the opinion that it is allied to the bacillus of BAERTHLEIN and THJØTTA. On the other hand Dr. ITO, an authority on this subject, considers *Bacterium coli* to be the responsible organism.

P. H. M-B.

BROUGHTON-ALCOCK (W.). **Case of Spirochaetal Dysentery.** (Abstract.) —*Proc. Roy. Soc. Med.* (Sect. Trop. Dis. & Parasit.). 1923. Aug. Vol. 16. No. 10. pp. 46–47. [1 ref.]

——. **Some Observations on Spirochaetic Dysentery.**—*Jl. State Med.* 1923. Oct. Vol. 31. No. 10. pp. 457–460.

The investigations of this author have led him to attach etiological significance to the spirochaete called *S. eurygyrata* (WERNER 1909), in chronic and intermittent cases of dysentery. This organism occurs in great numbers in the mucus passed in the acute or subacute stage of such cases. It is not found in the faeces, and it is said that when spirochaetes occur in the latter situation they are examples of *S. stenogyrata,* which is non-pathogenic. Two cases are quoted of acute dysentery in which the organism occurred in large masses in the mucus, and no other cause of the illness, either protozoan or bacterial, could be demonstrated. There is no known specific treatment.

P. H. M-B.

BOON VAN OSTADE (C. M.). **Coccidiosis bij den mensch.**—*Geneesk. Tijdschr. v. Nederl.-Indië.* 1923. Vol. 63. No. 4. pp. 670–674. With 1 text fig.

A case of infection with *Isospora hominis* is described in a Malay man, suffering from chronic diarrhoea with slimy but bloodless stools. The infection must have been acquired in Java or Sumatra. No other cause was detected for the diarrhoea, which remained uninfluenced by emetine, neosalvarsan, bismuth, opium, various enemas, bolus alba, or calomel. The author is inclined to ascribe the diarrhoea to the coccidiosis.

W. J. Bais.

WESTPHAL (Karl) & GEORGI. **Ueber die Beziehungen der** *Lamblia intestinalis* **zu Erkrankungen der Gallenwege und Leber.** [The Role of *L. intestinalis* in Affections of the Bile Ducts and Liver.]—*Muench. Med. Woch.* 1923. Aug. 17. Vol. 70. No. 33. pp. 1080–1084. With 3 figs. [10 refs.]

The flagellate *Lamblia intestinalis* inhabits the small gut. It was discovered in the duodenal juice as well as in the faeces of the same patient by Dr. J. ROTHMANN, who found it quite commonly in these situations in Germany. According to his observations its presence is associated with simple jaundice. Cases of this nature are cited. The occurrence of the flagellates is accompanied by spasmodic pains in the hypogastrium, especially over the gall bladder, resembling those of cholecystitis.

In a case recorded, that of a young woman who for a long time had suffered from these symptoms with tachycardia, etc., the gall bladder was removed and the organisms were found in numbers in its contents. As a control the duodenal juice obtained by aspiration was examined in 30 normal individuals, with a negative result.

The author regards Lamblia as mildly pathogenic, and believes that it can be to a certain extent killed off by the addition of 1–1000 solution of trypaflavine to the duodenal juice. Methylene blue solution, ·3 per cent., was introduced in doses of 200 cc., three times daily, into the duodenum. A definite diminution in the parasites in the stools took place.

P. H. M-B.

KHALIL (M.) & SHAWKY (I.). **Lamblial Dysentery treated with Carbon Tetrachloride.**—*Jl. Trop. Med. & Hyg.* 1923. Sept. 15. Vol. 26. No. 18. p. 285.

Lamblia intestinalis was the only pathogenic agent discovered in three cases of dysentery in Egypt. In the absence of any specific treatment for this infection, it was thought advisable to try the effect of carbon tetrachloride. To children the drug was given in 20 minim doses in water, followed in two hours by a purge of magnesium sulphate; to an adult 5 cc. was given. The parasites disappeared, but it is to be noted that the cases were not kept under observation longer than three weeks; nevertheless the author considers that the immediate relief of symptoms, together with the disappearance of the organism, warrants a more extensive trial of this method.

P. H. M-B.

LOPES (Renato de Souza). **Ensaio do tratamento da trichomonose intestinal pelo yatren.** [Yatren in the Treatment of *Trichomonas hominis*.]—*Brazil Medico.* 1923. July 14. Year 37. Vol. 2. No. 2. pp. 23–24.

The author affirms that *Trichomonas intestinalis* [*hominis*] is pathogenic in direct proportion to the numbers present. In some cases, after all the usual drugs had failed, Yatren was tried and yielded unexpectedly favourable results. It was given in doses of 1 gm. in capsule thrice daily for 10 days and, if the faeces still contained the parasite, the course was repeated in a fortnight. Intestinal lavage with iodine (iodine 5 gm., potassium iodide 10 gm., aq. dist. 150 gm., made up to a litre for injection) is recommended to be employed at the same time, and, if there is much intestinal irritation, the following is given in capsules three times a day: bismuth salicylate 50 cgm., tannigen 20 cgm., Dover's powder 20 cgm., powdered belladonna 3 cgm.

Brief details are given of two cases; in both when examined for Trichomonas after the second course the faeces were negative.

H. Harold Scott.

OHI (Tsukasa). **Investigation of Balantidium Colitis in Formosa.**—*Taiwan Igakkai Zasshi* (*Jl. Med. Assoc. Formosa.*) 1923. July. No. 229. pp. 19–20. In Japanese pp. 63–86. With 1 plate.)

Two cases of colitis due to *Balantidium coli* are described from South Formosa. Both patients suffered from irregular diarrhoea, anorexia, and thirst. On sigmoidoscopy ulcers were seen in the rectum usually about the size of a pea. Experiments made with a view to infect guineapigs, rabbits, dogs and monkeys failed, while similar trials with young pigs were successful. More than 60 per cent. of the indigenous pigs of South Formosa are infected with this parasite, and in the author's opinion present a sickly appearance as compared with normal animals. Outside the body the parasites live best in ascitic fluid, and can exist for two hours in normal saline solution.

P. H. M-B.

GREENE (J. L.) & SCULLY (F. J.). **Diet in the Treatment of *Balantidium coli* Infection.**—*Jl. Amer. Med. Assoc.* 1923. July 28. Vol. 81. No. 4. pp. 291–293. [31 refs.]

Until recently therapeutic measures in Balantidium infection consisted mainly in the use of drugs by mouth and by enemata. Apparently no single drug is sufficient: calomel, phenyl salicylate, ipeacuanha, emetine and thymol have been tried by the mouth with various results, while local treatment by enemata of protargol, salicylates, tannic acid, and quinine, have given no better results. Only a few writers mention diet; it has usually been considered as of secondary importance, but the authors consider it the essential factor. Their routine is very simple: the patient is given 2½ quarts of milk during the day, in small portions at regular intervals, supplemented later by eggs. The only drug used is bismuth subnitrate in 15 grain doses in order to relieve the cramps and to check the diarrhoea; later, stewed fruit is given. The cases they quote, four in number, responded very promptly to this plan. There was a rapid improvement in the general condition which is ascribed to the freedom from pain with its interference with rest and sleep, and to relief from the exhaustion of loss of fluid from the body. The cramps and tenesmus soon ceased and the parasites disappeared from the stools, in one case in 20 days, and in a second in 8, and were never found again.

P. H. M-B.

i. AIYA (Tomogoro). **[On the Relation between Distension of the Scrotum and the Prognosis of Diseases, with Special Reference to Ekiri and Infantile Dysentery.]**—*Tokyo Iji Shinshi* (*Tokyo Med. News*). 1923. Feb. No. 2315. [Summarized in *Japan. Med. World.* Tokyo. 1923. July 15. Vol. 3. No. 7. p. 165.]

ii HEFFERMAN (L. W.). **A Case of Ingestion of Hair by an Infant, with Symptoms simulating Dysentery.**—*Indian Med. Gaz.* 1923. Oct. Vol. 58. No. 10. p. 488.

i. The author thinks that in Ekiri and infantile dysentery the shrivelled up condition of the scrotum indicates a serious prognosis, but a smooth one often the opposite.

ii. A baby aged four months suffered from dysenteric symptoms and on the third day passed a hair seven inches long, which was recognised as belonging to one of the family; after this recovery was uneventful.

P. H. M-B.

SPRUE.

Scott (H. Harold). **The Treatment of Sprue based on a New Theory of Causation.**—*Lancet.* 1923. Oct. 20. pp. 876–878. [4 refs.]

In this paper Scott gives details of cases treated according to his new method (see this *Bulletin*, Vol. 20, p. 733). Progress of four cases is cited in detail, while there are six others equally favourable of which particulars are not given. The average stay in hospital has been 5–6 weeks. The theory previously recorded, upon which this treatment is based, postulates that endocrine disturbance and alimentary toxaemia are frequently associated, while all acute and chronic toxaemia reacts in some degree upon the parathyroid glands, causing disturbance of calcium metabolism and a consequent decrease in tissue resistance. In the normal faeces the ratio of neutral fat to fatty acids is 1 : 2. In cases of pancreatic disease this proportion is reversed and may be as high as 15 : 1. In sprue the proportion is found to be 1 : 3, and in a grave case 1 : 9.

It has been observed that some cases of sprue do not do well on pancreatized food, that in cases of hyperchlorydria symptoms of the disease may reappear and can only be abolished by going back to milk. Again it has been shown that internal secretion of the pancreas reacts upon other endocrine glands and on the salivary glands. It is suggested that the sore condition of the mouth and tongue may be due to altered salivary secretion. These facts are taken to show that there is an over-stimulation of the pancreas.

As regards the evidence of error in calcium metabolism the decrease of this substance may be of two types. It may be absolute, when the total amount in the serum is lessened, or it may be relative, when the total is unchanged. In either case the effect upon the somatic cells is the same, they suffer from a deficiency of calcium. The "ionic" calcium of the blood becomes deficient in cases where chronic toxaemia is present. The symptoms such as tetany, cramps, oedema, loss of weight, excess of calcium salts of the faeces, and the ulceration of the intestinal canal, may all be ascribed to deficiency of calcium. When calcium is administered in sprue the increase makes up temporarily r the deficiency, and symptoms improved, but this improvement s transient only, and it was found that the dose had to be increased. . regulation of calcium absorption can be controlled by the administration of parathyroid. The alimentary toxaemia is shewn by acidity, flatulence and secondary anaemia. The various forms of treatment now in vogue are reviewed ; it is pointed out that none of them rests on any scientific basis.

Milk acts as a non-irritating food, allows the ulcers to heal and is a good method of administering calcium. As regards the geographical distribution it is suggested that possibly sprue may occur in Europe, but no explanation is forthcoming of the apparent absence of the disease from Central Africa.

Finally the author suggests that there are two distinct classes of sprue. Those arising in India and the East are associated with an excess of proteid diet and hyperchlorydria. These are the patients who complain of a recurrence of symptoms when given pancreatized food. Other cases develop symptoms while on a fatty diet with organic hyperacidity and hypochlorydria. Both do well on calcium treatment. The latter are able to take pancreatized food. Overstimulation of the pancreas is probably the result of excessive production of secretin.

P. H. Manson-Bahr.

COUSLAND (Philip B.). **The Treatment of Sprue.** [Correspondence.] —*China Med. Jl.* 1923. July. Vol. 37. No. 7. pp. 622–623.

A letter dealing with the results of the Calcium lactate and parathyroid treatment of Dr. H. Harold SCOTT; it outlines also the therapeutical considerations on which it is based. The dramatic improvement which took place in SCOTT himself as a result of this treatment, even when all dietary restrictions were disregarded, is described, and he is said to be just as keen a "demon for work" as formerly.

A second case is mentioned of a missionary from South China who was dissuaded from returning to the East on account of the possible danger of recurrence. After a few days of SCOTT's treatment he is said to have eaten fat pork for lunch in large, thick slabs, followed by boiled roly-poly pudding, without any disagreeable consequences.

P. H. M-B.

JAMIESON (T. H.). **The Treatment of Sprue.**—*Brit. Med. Jl.* 1923. Sept. 15. p. 462.

The clinical resemblance between coeliac disease and sprue has already been noted by several observers. It was therefore determined to treat 3 sprue cases on the fat-free diet used in coeliac disease. This diet is as follows :—

5 a.m.	Cup of weak tea, one round of dry toast.
8 a.m.	1 oz. of casein, 1 pt. skimmed milk, ½ pt. tea without sugar, four rounds of dry toast, 1 oz. of cheese.
11 a.m.	½ pt. of skimmed milk, ½ oz. of casein.
11.30 a.m.	Juice of one orange.
12 noon	1 pt. liver soup, 2 ozs. minced chicken, 2 rounds of dry toast, 4 ozs. of junket, 4 ozs. of calf's foot jelly. (The junket should be made with skimmed milk.)
4 p.m.	1 oz. of casein, 1 pt. of skimmed milk, ½ pt. weak tea, without sugar, 1 oz. of cheese, 2 cream crackers.
8 p.m.	1 pt. skimmed milk, 1 oz. casein, 4 ozs. of junket, 4 ozs. of calf's foot jelly.
10 p.m.	Juice of one orange.

Three cases recorded have all done well, in one instance increasing from 7 st. 3 lb. to 12 st. 2 lb. in weight.

P. H. M-B.

SILVERMAN (Daniel N.) & DENIS (Willy). **Tropical Sprue and its Relationship to Disturbances of Pancreatic Digestion.**—*Southern Med. Jl.* 1923. July. Vol. 16. No. 7. pp. 503–506. [10 refs.]

The results of enzymic activity of the duodenal contents in a typical case of sprue before and during clinical improvement are here recorded.

Attempts at testing the faeces for ferments should be discouraged, since this method of analysis is cumbersome and inaccurate. Recent investigations show that lipase-tests are constant for duodenal contents, but this ferment is not demonstrable in the faeces.

In the present case the fasting duodenal contents had an H-ion concentration of 7·2. The enzymic activities were as follows:—

1. Lipolytic activity 0·5 cc. (Expressed in cc. N/10 NaOH.)
2. Amylolytic activity 0·6 mg. (Expressed in mgm. of glucose.)
3. Proteolytic activity 0·9 mg. (Expressed in mgm. non-protein nitrogen.)

On placing the patient on a meat and milk diet together with pancreatin and calcium lactate immediate improvement took place; the duodenal contents were then re-examined for their respective ferments with the result that the quantitive enzymes were:—

Lipolytic activity 2·7 cc.
Proteolytic activity 1·3 mgm.
Amylolytic activity 1·6 mgm.

The amount of lipase found in this analysis represents approximately four times its strength in the first examination. These facts encourage the belief that in sprue the pancreas does not always undergo extensive or permanent damage.

P. H. M-B.

Scott (H. Harold). **A New Theory as to the Causation of Sprue and the Results of Treatment based thereon.**—*China Med. Jl.* 1923. July. Vol. 37. No. 7. pp. 581–584. [1 ref.]
[See this *Bulletin*. Vol. 20. p. 733.]

SLEEPING SICKNESS.

DUKE (H. Lyndhurst). **Further Inquiries into the Zoological Status of the Polymorphic Mammalian Trypanosomes of Africa, and the Means by which they are spread in Nature.**—*Parasitology.* 1923. Sept. Vol. 15. No 3. pp. 258–295. [30 refs.]

The first portion of this paper relates to the effect of continued direct transmission on a strain of polymorphic trypanosomes originally recovered from wild lake-shore *G. palpalis* in Victoria Nyanza. The earlier stages of the experiments have already been published [this *Bulletin*, Vol. 19, p. 123]. The strain was one of the gut-and-gland group of organisms derived from *G. palpalis* and was recovered in January, 1920, in Monkey 43 upon which the flies were originally fed; the duration of the disease in the monkey was 63 days. From this monkey a second Monkey 59 was infected by cyclical passage through laboratory-bred flies. Starting from Monkey 59 a series of passages by direct transmission was carried out as shown in a table. To effect the earlier passages clean laboratory-bred *G. palpalis* were used, infection being secured by interrupted feedings; the method proved tedious and at the eleventh passage was given up for that of inoculation of a small quantity of citrated blood. The strain began to increase in virulence at the 15th passage and after the 35th passage it was found necessary to introduce a guinea-pig into the series as monkeys were not available; the experiment was continued to the 42nd passage when, unavoidably, the strain was lost; the same species of monkey, a greenish-grey *Cercopithecus,* was used throughout. A considerable number of attempts were made to obtain cyclical transmission by means of laboratory-bred *G. palpalis* with the later passages (34th onwards) of the direct transmission strain. Details are given in a couple of tables and the results show that *in not a single one of the flies used in these experiments were any flagellates found.* It is evident, therefore, that the strain had completely lost the power of developing cyclically in the Glossina from which it was originally recovered. At what stage in the series this power was lost it is impossible to state, the last positive transmission experiment being at the 11th passage.

Similar experiments were performed with a strain obtained from an antelope shot in Damba Island in September 1920; this strain is still being maintained by direct passage, but has not yet shown any strikingly enhanced virulence. As is shown in a table the strain had undergone 29 passages between September 1920, and November 1922. A series of transmission experiments were performed with laboratory-bred *G. palpalis* at the last passages (28th and 29th); as is shown in a table 2·2 per cent. of the flies were found to contain flagellates, but in no case were flagellates found in the salivary glands and all the transmission experiments were negative. In previous experiments carried out between October 5, 1920, and January 26, 1921, the percentage of infective flies was ·68, and consequently it is clear that an important change had occurred in the strain between January, 1921, and November, 1922. The percentage of positive flies is about the same, but that of infective flies is nil. It is to be noted that both strains retained their polymorphism throughout the experiments. With reference to these experiments the author writes:—

"If a conclusion is justifiable from the limited evidence set forth in Part I it is that continued upkeep by direct transmission leads first of all to the loss by the trypanosome of the power of invading the salivary glands, and this is followed later, in the history of the strain, by the complete loss of the power to develop in any part of the alimentary canal of the insect. Further, I think that the evidence we have before us tends to support the view that the cyclical development of the trypanosome in the fly is not a sexual process. . . .

" Applying these results to the spread of trypanosomes in human communities, we should expect direct transmission to function for a time without producing any noticeable effect on the strain so transmitted. Sooner or later, if conditions were favourable, the virulence of the parasite would increase, and direct transmissions would, in consequence, become increasingly frequent.

" As the virulence increased the trypanosome would lose its power of cyclical development in the tsetse, until it came to rely, for its transmission from man to man, entirely on the direct method.

" In such circumstances the epidemic would continue for just so long as the conditions admitted of spread by the direct method. When this became no longer possible the strain would presumably die out.

" Probably, in actual life, the enhancement of the virulence of a strain of human trypanosomes only occurs where the contact between fly and man is very intimate, and the passage of the parasite from host to host, in consequence, very rapid."

The second portion of the paper is an attempt to discuss the trypanosomiasis problem in the light of the theories put forward in two previous papers [this *Bulletin*, Vol. 15, p. 377, and Vol. 19, p. 123]. The author points out that the polymorphic mammalian trypanosomes whose development in Glossina has been worked out are by general consent divided into two categories each comprising several so-called species, viz.: *T. gambiense* with *T. nigeriense*, *T. multiforme*, BALFOUR's trypanosome from a mule in the Sudan, and the trypanosome isolated from domestic animals in Principe on the one hand, and on the other hand *T. brucei* with *T. rhodesiense* and a number of organisms isolated by various people from game and stock in different parts of Africa. The two categories are generally differentiated from one another by differences in virulence and by the presence or absence of " posterior-nuclear " forms.

Discussing the question of " posterior-nuclear " forms, Duke believes that their occurrence is intimately connected with virulence and that it is unjustifiable and misleading to endow this character with specific value. The author next considers the significance of virulence in the classification of trypanosomes and concludes that it is unreliable. The essential characters upon which classification of the mammalian trypanosomes should be based are morphology and behaviour in the normal insect intermediary.

In contrast to stock, man is for all practical purposes absolutely immune to the " proboscis-only " and the " proboscis-and-gut " groups of trypanosomes, and the rarity of human trypanosomiasis in the huge areas in which man and the game-tsetses come into contact shows conclusively that he is also extremely resistant to *T. brucei*. The author believes that for many centuries man has played a considerable part as a host, in *palpalis* areas, both to the polymorphic trypanosome and to the fly; this entails the existence of a state of equilibrium between man and the trypanosome in its cyclically transmitted form. On the other hand, in *morsitans* and *pallidipes* areas, man has been relatively refractory to trypanosomes carried cyclically by the fly.

The opening up of Tropical Africa during the last few decades has had far-reaching effects; traffic channels have been developed everywhere and the advance of civilization has dealt a heavy blow to the big game; almost everywhere its range has contracted and its number diminished with the result that the fly has been compelled to turn its attention seriously to man as a food animal. The common result of scarcity of game is a concentration of Glossina along the traffic routes and around the villages in the belt. The change affects man in two ways: he is deprived of a source of food and he receives the undivided attention of the fly, with the result that the natives are subjected with increasing frequency to an ordeal which, under normal conditions, their forefathers withstood for ages—namely the introduction into their blood of a copious dose of the salivary-gland forms of *T. brucei*. The chances of the trypanosome obtaining a footing will be still further increased by any influence which debilitates the population and Duke believes that this is the manner in which *T. brucei* establishes itself in man.

After summarizing the reasons for believing that *T. rhodesiense* and *T. brucei* are identical, Duke continues to consider the spread of *T. brucei* in man. Reference is made to TAUTE's experiments [this *Bulletin*, Vol. 2, p. 348, and Vol. 15, p. 35] and to the fact that the author and a native were bitten by a gut-and-gland infected *G. swynnertoni* without developing trypanosomiasis [*loc. cit.*, Vol. 20, p. 309] as evidence that the *brucei* organism, when carried cyclically by the fly, cannot infect man. Duke believes that the reviewer was substantially correct when he stated his opinion that the same negative result would have followed had TAUTE used flies cyclically infected from a human case of *T. rhodesiense**, but he considers the reviewer's explanation that the great majority of the human race is naturally immune to *T. brucei* to be inadequate. He doubts whether it is reasonable to suppose that any person constitutionally susceptible to the ordinary *T. brucei* present in the game and fly could reach puberty without succumbing to his handicap. Yet in Nyasaland the great majority of the cases are adults. Some other explanation of the occurrence of the disease in Nyasaland and Rhodesia is necessary.

> " A negative result, in the circumstances supposed by Yorke, need not necessarily be due to the natural immunity of the individual towards all strains of *T. brucei*; it would be equally explicable on the supposition that the power of survival in man was so feebly implanted in the particular strain of trypanosome under investigation that this power was eliminated during the cyclical development of the organism in the tsetse. In other words Taute's experimental natives, if bitten by a fly carrying another strain of *T. brucei*, might have become infected; whereas, if Yorke's explanation is correct, these particular persons are absolutely safe from all cyclically carried strains, be they *T. brucei* or *T. rhodesiense*.
>
> " It is possible, therefore, to explain the sporadic cases of human trypanosomiasis found in Nyasaland and Rhodesia by assuming that some of the wild-fly strains of *T. brucei* can infect man, while others—forming the great majority—cannot."

Duke believes that doubtless the constitution and health of an individual will at times play a part in deciding whether he will become infected or not and that ankylostomiasis may serve as an important ally of the trypanosome. In Nyasaland and Rhodesia there are, apparently, human strains of *T. brucei* carried by wild *G. morsitans*, but how these strains acquired the power to infect man it is impossible to say; they are, the author considers, of recent appearance.

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* *Trans. Roy. Soc. Trop. Med. & Hyg.* 1920. Vol. XIV, p. 31.

The only instance of *T. rhodesiense* in an epidemic form recorded is the outbreak near Mwanza and here the history and distribution of the disease point to direct transmission as the principal means by which the trypanosome passed from man to man [this *Bulletin*, Vol. 20, p. 309 and p. 311]. As has already been shown in the earlier part of this paper increased virulence, acquired in the course of prolonged upkeep by direct transmission, may eventually be accompanied by the loss of power to develop in the fly, and when the epidemic has reduced the population to the limit below which direct transmission can function on a large scale the outbreak dies out. In answer to the question what happens to the trypanosome when the epidemic works itself out, the author writes as follows :—

> "During the earlier stages of an epidemic the parasite must frequently be exposed to chances of cyclical development in the fly, and doubtless most of these early strains are successful. The probable result of cyclical passage through the insect at this stage will be the loss of the newly acquired power of survival in man. But, as the epidemic progresses, and especially if the disease is not very virulent, it is possible that this power to survive in man may become so firmly rooted in the strain that it can survive the test of cyclical transmission by the tsetse. In this way a cyclically transmitted human strain may be established in wild fly.
>
> "The future career of the trypanosome as a human parasite probably depends on the extent to which game is available to the fly."

The next section deals with the proboscis-and-gut group of trypanosomes and its analogy to the gut-and-gland group; and the following one with man's relation to the polymorphic trypanosomes of *palpalis* regions. It is a remarkable fact that practically wherever man and *G. palpalis* have been in age-long contact, human trypanosomiasis is found in some form or other. The French in the Congo recognize two types of the disease in *palpalis* areas—a mild endemic form, and an epidemic form, which is much more virulent and at times causes an appalling mortality; epidemic outbursts may occur in an endemic area and after such an outburst the disease may once again assume its milder endemic form. CLAPIER has shown that where the disease is endemic the young of both sexes show the greatest proportion of infects and suspects, but in epidemic areas young and old are attacked equally (this *Bulletin*, Vol. 19, p. 124). The explanation given is that in endemic areas almost everybody is infected in the days of his youth, but that with increasing years, a labile immunity is acquired; in its epidemic form there is no immunity. With reference to the assertion of the French that mosquitoes play an important part in the spread of the disease Duke states that his observations have convinced him that tsetses are much more prone to flit from host to host in their efforts to feed than are mosquitoes and that the structure of their proboscis makes them more suited to direct transmission. CLAPIER's record [*loc. cit.*] that in an epidemic area trypanosomes are commonly present in the peripheral blood is significant in this connexion and shows that the disease in its epidemic form presents one of the features essential to direct transmission. "In *palpalis* regions we must, therefore, recognize the existence of *two types of trypanosomiasis due to the gut-and-gland group: a mild cyclically-transmitted endemic form, and a virulent epidemic type that relies mainly on direct transmission for its spread.*"

With regard to *T. gambiense* and *T. brucei* :—

These trypanosomes "manifest identical morphology in man and in monkeys and in stock, and they behave in the same way in the insect intermediary Their distribution coincides roughly with that of *G palpalis* in the one case and the game-tsetses in the other, and their principal mammalian hosts are, respectively, man and game Differences in environment are amply sufficient to account for such differences as exist between the two trypanosomes

" I feel confident that epidemic strains of *T gambiense* will be found in *palpalis* areas in the Congo, and that these, under suitable handling, will yield posterior nuclear forms "

The last section deals with the big game as a reservoir for trypanosomes, especially for those of men The author summarizes his views on this subject as follows —

The game in game-tsetse areas is the main natural reservoir of the proboscis-and gut and proboscis only groups of trypanosomes, but in as much as we must assume that man, under exceptional circumstances, can be infected by wild flies cyclically carrying the gland and-gut group the game is also a reservoir, in game tsetse areas, of the human parasite known as " *T rhodesiense* '

" In *palpalis* areas man is the main reservoir for the trypanosome known as *T gambiense* In game tsetse regions man is probably a more important reservoir than the game for human strains of this group of trypanosomes, because direct transmission (from sporadic human cases infected by the cyclical route) may cause an epidemic outburst in a human community It is also possible that there is in the process of adaptation to man of the *brucei* form of trypanosome, a stage at which cyclical transmission from man to man occurs

" But in both types of fly area, and particularly in game-tsetse areas, the game acts as a shock absorber in regard to man, and this beneficial protective action probably considerably outweighs its power for harm as a reservoir The presence of the game simultaneously diverts the attention of the tsetse from man and leads to the suppression in the trypanosome of the potential quality of survival in man

" The practical outcome of these conclusions is that *we should concentrate our attack directly on the fly*, which we know to be an indispensable factor in the spread of human trypanosomiasis "

[Even in a somewhat long summary it is difficult to do full justice to this thoughtful and stimulating paper Although the reviewer cordially agrees with most of the author's arguments and contentions, certain of the conclusions appear to be open to criticism A discussion of the various points is, however, impossible here and the reviewer has limited himself to giving in the space available as clear a statement as possible of the author's views The paper should be studied carefully by all interested in the epidemiology of sleeping sickness]

W. Yorke.

MARTIN (Gustave) **Distribution géographique et prophylaxie de la maladie du sommeil dans les Colonies françaises d'Afrique** — *Congrès de la Santé Publique et de la Prévoyance Sociale, Marseille, 11–17 Septembre, 1922 Rapports* pp 314–351. [60 refs]

The author gives an interesting general summary of the distribution of sleeping sickness in the French African Colonies and of the results of measures devised to deal with the situation.

He writes that the prophylactic service has in 1921 accomplished a great deal, as is evidenced by the report of the principal medical officer, BOYÉ [this *Bulletin*, Vol. 20, p. 314]. In the 10 divisions of which five functioned during the entire year 1921 and five during a part of it, 559,658 natives have been examined. Among these were 18,800 cases of sleeping sickness previously discovered in four of the divisions and 9,789 new cases, making a total of 28,589 cases, *i.e.*, about 5·18 per cent. of the persons examined. All these cases have been given atoxyl two to five times and some of them more frequently. To these figures must be added 7,061 cases discovered in the Cameroons, making a total of 35,650 cases regularly under supervision and treatment.

The atoxylization has had excellent immediate results; besides its sterilizing action thus diminishing the number of carriers of the virus, it has equally influenced the general health of the infected, and seems also to have had a good effect on the birth-rate. In most of the divisions the number of new cases contaminated is insignificant. In the subdivision of Marali the number has, according to HUOT, diminished by 45 per cent. and in that of Fort-Crampel by 43 per cent.

JAMOT recorded that during the year preceding the operations of the service, 2,071 persons died of sleeping sickness in Oubanghi-Chari, whereas in the following year as the result of treatment by atoxyl alone or by this associated with novarsenobenzol, the deaths fell to 714, *i.e.*, a decrease of 65 per cent. All the epidemic areas dealt with —and some of them were of extreme violence—were got under control; and the mass of virus in the circulation was lessened by 80 per cent.

In the Bas-Oubanghi more than six years after an energetic prophylactic campaign which was, however, prematurely interrupted, CLAPIER re-examined a third of the recorded cases, and in 80 per cent. it was no longer possible to find trypanosomes. In the Ibenga-Motaba division, of the 1,072 cases discovered in 1914, 373 were found on January 1, 1921, and 341 on January 31, 1921; most of these were in good condition and did not exhibit trypanosomes in the circulation.

The author concludes that the campaign against sleeping sickness undertaken in French Equatorial Africa and in the Cameroons must be carried on with continuity and perseverance. Only by frequent search for recent cases and by the administration of immediate and methodical treatment is it possible to obtain good results. New prophylactic services must be started; the segregation camps are too few and must be multiplied. Vigorous and strong action should be taken simultaneously in heavily infested regions and also in those which up to the present have been relatively spared. In French Equatorial Africa the minimum annual expenditure necessary for the functioning of 15 divisions is a million francs.

W. Y.

HUOT. **La prophylaxie de la maladie du sommeil dans la région de Doumé (Territoires du Cameroun), octobre 1920–juin 1922.**—*Ann. de Méd. et de Pharm. Colon.* Paris. 1923. Jan.–Feb.–Mar.–Apr. Vol. 21. No. 1. pp. 5–42. With 1 sketch map in text.

Reference to the German records indicates that no very active focus of trypanosomiasis existed to the North of Doumé before 1914. In the course of 1918–19, PEYRONNET found fairly numerous cases in the villages of M'Vangs and in 1920, JOJOT found 182 cases among 3,042 persons examined in the Akonolinga-Doumé district. The author on his arrival at Doumé in October, 1920, found considerable foci of the disease in North Doumé which had not been suspected by the administration.

The second portion of the report is concerned with an account of the country and its population and of the distribution of the tsetse. Practically the only domestic animals found apart from fowls and ducks are a few goats.

The next section deals with the organization of the medical service and of the methods of examination and treatment. In a table details are given of the number of men, women and children examined in various villages and groups of villages and the number of each found to be infected ; of a population of 35,322 persons, 10,661 men, 6,869 women and 9,600 children were examined and 1,219 men, 713 women and 697 children were found to be infected. The two endemic foci on the upper Doumé and on the upper Sanaga appear to have extended and finally fused in the region of the forest of Deng-Deng. Very grave epidemics have resulted in the last few years and these have been aided by the lowered resistance of the population which has for a long time been living in unhealthy camps in the bush and has suffered from insufficient food. The savannah districts to the East and West of the forest have remained almost free.

A detailed account is given of the results—prophylactic and curative—of various methods of treatment. The results obtained by treating 284 cases at Doumé by weekly doses of 0·5 gm. atoxyl are summarized in a table. Blood examinations made during treatment in patients who had received a course of 10 to 20 weekly injections resulted in the finding of trypanosomes 26 times in 256 examinations. In patients who had improved and whose blood had been found negative, a further examination made three to four months after cessation of treatment showed that the sterilization had been maintained in 90 per cent. of cases. Several cases, however, where clinical conditions had greatly improved showed trypanosomes in the blood and latterly all such cases were given two injections of 0·6 gm. of neosalvarsan separated by four weekly injections of atoxyl ; the result of this appeared satisfactory. Of the 284 cases treated 15 died during the period of 19 months—4 who were at the time of treatment in advanced condition, 2 from accidents, 5 from intercurrent infections and 4 who had not undergone regular treatment. Of 191 cases treated at least a year 111 (58 per cent.) who had received 2 or 3 series of 20 injections of atoxyl appear to be cured. The initial dose of the drug was 1 gm., the remaining doses were 0·5 gm.

The next method of treatment referred to is that of injection of massive doses at intervals of a month or more. The cases coming from heavily infected regions, districts of advancing epidemics and zones of moderate endemicity are considered separately. This method gave good results from the point of view of reduction in the mass of the virus ; the coefficients of sterilization varied from 85 to 90 per cent. This work has been carried out under most unfavourable conditions owing to the extremely primitive mentality of the natives and their tendency to shift about from place to place and to disperse to encampments situated in most unhealthy localities ; nevertheless, the last tour through the most severely affected regions has shewn a striking change in the appearance of the population, and the natives themselves appreciate the improvement. The last section of the report deals with the administrative measures.

W. Y.

CARPENTER (G. D. Hale). **Report of Senior Medical Officer i/c Sleeping Sickness for 1922.**—*Uganda Protectorate Ann. Med. & San. Rep. for the Year ended 31st December, 1922.* pp. 58–60.

Early in 1922, the author visited the districts of Gulu and Chua. The situation in Gulu is much the same as in Madi; with the exception of the R. Toshi and its tributaries all the streams are fly-infested and the suppression of sleeping sickness depends upon the enforcement by the administration of adequate clearing of crossings over streams and of watering places. In Chua there is no indigenous sleeping sickness but many of the rivers are infested with *G. palpalis* which seems as yet not to be infected. A total of 3,351 men, 3,066 women and 3,141 children were examined and only three cases found, and these had come over from Gulu. The danger to Chua appears to lie in traffic from Gulu, and administrative means are to be taken to control this.

In August the Katwe area was visited in order to arrive at a satisfactory decision regarding the closed area of the Kigezi district and as a result it was decided to open two large parts of the closed area giving ample opportunity for safely conducting the fishing industry. The author then proceeded to Kazinga where Dr. MARSHALL had reported in August, 1920, that nearly 18 per cent. of the population were infected and had recommended the destruction of the village. It was found that with an increase of 58 per cent. of the population there were no cases at all of sleeping sickness; the clearings had been maintained satisfactorily and it was agreed to extend the area permitted. The state of affairs at Katwe was equally satisfactory; MARSHALL had reported in 1920 that probably over 15 per cent. were infected, but in October, 1922, Carpenter, who examined the whole population of 267 men and 134 women and children, found only one man and one woman infected and these had without doubt been infected on the upper reaches of the Nyamagasani river which comes down to Katwe. All was well at L. George where a ferry was opened a year ago and it was decided that more land west of the landing at Mahyoro should be taken up when properly cleared.

The situation in the Mpologoma area is a little uncertain, but that in Madi is more hopeful; many of the author's previous recommendations have been put into force and much has been done.

W. Y.

LESSA (Gustavo). **A epidemiologia da molestia de Chagas.**—*Boletim Sanitario.* Rio de Janeiro. 1923. Aug. Vol. 2. No. 3. pp. 1–27. [43 refs.]

Seventeen species of Triatoma have been reported as existing in Brazil; 11 of these are vectors of *Schizotrypanum cruzi.* Two species of Rhodnius and two ticks (*Rhipicephalus sanguineus* and *Amblyomma cayennense*) also harbour the parasite. Infected Reduviidae have been found in several districts, notably S. Paulo, Bahia, Lassance, Matto Grosso, Parnaguá and Goyaz.

Chagas' disease is of wide prevalence in the rural districts of Brazil and has also been reported from Venezuela and Peru. It probably exists in all parts where infected vectors are found. To prove this point it is suggested that research posts should be established in various parts of the interior.

Infection usually takes place in early life, and, in fact, may even be congenital. Of 28 acute cases in Lassance 25 were under two years of age. In the young the course is often rapid and nearly half the cases terminate fatally.

As regards the connexion between Chagas' disease and enlargement of the thyroid the author states that myxoedema is a constant feature in acute cases and the domiciliary distribution of the Triatoma is the same as that of goitre, but it is not yet proved to what extent the relation is causal.

H. Harold Scott.

CROWELL (Bowman Corning). **The Acute Form of American Trypanosomiasis; Notes on its Pathology, with Autopsy Report and Observations on Trypanosomiasis cruzi in Animals.**—*Amer. Jl. Trop. Med.* 1923. Sept. Vol. 3. No. 5. pp. 425–454. With 10 text figs. [8 refs.]

This paper gives a detailed account of the morbid anatomy and histology of the tissues obtained from a fatal case of the acute form of Chagas' disease

The following summary is given :—

" This trypanosome has been previously shown to possess morphologic and biologic characteristics which differentiate it from other trypanosomes. In its pathogenicity it also differs in some respects from the other trypanosomes, and this difference in large part depends upon the fact that it becomes a histoparasite and upon the types of cells that it infests. In trypanosomal diseases in general the changes produced are conceived as being due to the direct action of the parasites and to the toxins derived from them. In dealing with the action of the *T. cruzi* there also enters into consideration the actual destruction of fixed tissue cells (muscle fibres, etc.) caused by the multiplication of parasites within them to such an extent as to rupture the cells, and the sequent reaction to this destruction of tissue on the part of the wandering cells of the body.

" As regards the types of cells infested by the *T. cruzi* we are dealing with derivatives of the mesoderm (muscle, fat endothelium, suprarenal gland, ovary, uterus, testis, serous membranes), entoderm (thyroid, thymus, liver, etc.), and ectoderm (ganglion cells and glia (?) cells). In severe cases of acute infestations all of these tissues may be parasitized and it is then difficult to consider the parasite as having a special predilection for any one tissue. However, in less severe infestations and in cases that become chronic the parasite undoubtedly shows a definite predilection for certain tissue and among these the muscle tissue, especially cardiac, nerve tissue and endothelium are prominent.

" The trypanosome multiplies within these tissues even at a very early stage of the disease and soon (not usually later than the first month in human cases) disappears from the peripheral circulation. In spite of the fact that the organisms must reach the circulating blood again when freed by rupture of their host cells, they nevertheless disappear; this disappearance can best be explained by some constituent of the blood that is inimical to the life of the trypanosome."

W. Y.

REICHENOW (Eduard). **Untersuchungen ueber das Verhalten von *Trypanosoma gambiense* im menschlichen Körper.** [Investigations on the Behaviour of *T. gambiense* in the Human Body.]—*Ztschr. f. Hyg. u. Infektionskr.* 1921. Vol. 94. No. 2/3. pp. 266–385. With 2 coloured plates, 8 figs., and 20 graphs. [119 refs.]

The work upon which the paper is based was done between March 1913, and August 1914, at the sleeping sickness camp of Ajoshöhe on the upper Njong in the Cameroons. The paper is of considerable length and portions of it deal with matter published elsewhere and already noticed in this *Bulletin* [Vol. 19, p. 127 and p. 128].

The first portion of the paper relates to the parasite as it appears in the blood. As the trypanosomes are, as a rule, so scanty in the peripheral blood the author used in his investigations the thick film method. He gives details regarding the preparation of thick films and points out that the reason why certain observers have obtained but poor results with them is that they have used too much blood and made their films too thick. *T. gambiense*, like other pathogenic trypanosomes, behaves in the blood in one of two ways: either the parasites increase in number from day to day until finally a maximum point is reached, or they disappear from the blood sooner or later to reappear again; finally, the host dies after the increase and disappearance has taken place a greater or smaller number of times. The appearance of this periodicity, the length of the periods, and the extent of the parasitic increase are very different according to the host and to the virulence of the trypanosome strain used. The author followed the variation in the number of parasites in the blood from day to day in a series of patients and the results are set forth in a table and a number of graphs. In the section dealing with the cause of the periodic disappearance of trypanosomes from the blood, the author, after referring to the many references in the literature bearing on the subject, writes that he has observed the process in numerous cases of human trypanosomiasis and that it is easily demonstrable that the flagellates die in the blood plasma without the intervention of the phagocytes; moreover, the process takes place not in any particular organ, but everywhere in the blood stream. A description is given of the dead and dying parasites, as they appear in fresh preparations and in stained films.

The author then refers to the fact that in *T. gambiense*, and also to a greater or less extent in all species of trypanosomes, the various individuals exhibit morphological differences. Reference is made to the different theories advanced to account for this polymorphism; as the result of his own observations Reichenow agrees with OEHLER, who considers that these differences are to be correlated with varying degrees of virulence. The vast majority of long slender forms are found during periods of rapid increase in the number of parasites, while the short plump forms are to be observed shortly before the periodic disappearance of the parasites. The relative number of long and short forms is a criterion of the virulence of a strain; the weaker its virulence the greater the number of short forms.

The short forms must be present in the blood before it can infect Glossina (MINCHIN, 1908 and Muriel ROBERTSON, 1912–13), as these forms exhibit most resistance to unfavourable conditions such as obtain during the first hours of change from human blood to the gut of the fly. Glossina are more easily infected from early cases of the disease; Reichenow never succeeded in infecting them from cases in an advanced stage, probably owing to the fact that flagellates are then only found in the blood in a state of great activity. It is also possible that after long sojourn in the blood of man or an experimental animal, the trypanosomes have undergone biological changes of such a character as to render even the short forms incapable of developing in the fly.

. The next section deals with the trypanosomes in the cerebrospinal fluid. Details are given of the technique employed for estimating approximately the number of parasites per cc. of spinal fluid. Ten cubic centimetres of fluid are centrifuged for 10–15 minutes and the bulk of the supernatant fluid removed; the tube is then shaken so as to mix the sediment with the remaining fluid and the whole withdrawn on to a slide and dried in the sun; by this means the trypanosomes collect in the outer edge of the drop, the cells being distributed all over the area. The films are stained with Giemsa and counted. The results obtained from 171 lumbar punctures in 97 cases are given in tabular form. This valuable table, which occupies 26 pages, gives information regarding the sex, age and general condition of the patient, the nervous symptoms, the previous treatment, the date trypanosomes were first seen, the date of lumbar puncture and condition of the blood at the time of this, and the state of the spinal fluid as regards pressure, cell content and trypanosomes.

Nothing is known of the manner in which the parasites enter the cerebrospinal fluid and very little regarding the period of the disease at which it occurs. Reichenow's observations lead him to believe that the cerebrospinal fluid does not become infected for at least three months after the beginning of the disease. He has never seen a case in which the spinal fluid remained free from parasites for longer than a year. The number of trypanosomes found in 10 cc. of the cerebrospinal fluid varied from 1 to 2,000; smaller numbers were more frequent than the larger. In one-third of the cases the number of parasites per 10 cc. of fluid was ten or less. The forms found in the spinal fluid always had a well developed flagellum; sometimes the parasites were more slender than any found in the blood, short forms were never seen, divisional forms were common. An account is given of the increase of the cellular contents of the spinal fluid and the morphology of the cells encountered. This part of the work has already been discussed elsewhere as has also the last section of the report contrasting the behaviour of *T. gambiense* and *Sp. pallida* as regards the central nervous system [*loc. cit.*].

W. Y.

KLEINE (F. K.) & FISCHER (W.). **2. Bericht ueber die Prüfung von "Bayer 205" in Afrika.** [Second Report on the Use of "Bayer 205" in Africa.]—*Deut. Med. Woch.* 1923. Aug. 10. Vol. 49. No. 32. pp. 1039–1041. [1 ref.]

In their previous report [this *Bulletin*, Vol. 20, p. 317], the authors showed that feeding infective Glossina on animals which had been treated with "Bayer 205" did not destroy the trypanosomes in the salivary glands. This line of work was continued in order to determine whether the drug had any influence on the developing parasites in the gut of the flies and the results showed that this was not the case.

It is recorded that the two oxen referred to in the first report which had received large doses of "Bayer 205" shortly before infected flies were fed on them have since showed trypanosomes in their blood. In order to confirm this failure of prophylactic action on the part of the drug, four other experiments were performed on cattle of which the following is an illustration:—Ox 9 received from April 24 to April 27 1922, daily injections of 2·5 gm. of "Bayer 205" subcutaneously. After 15 days—between May 5 and May 18—1,014 flies were fed on it; then on May 22 and May 23 it received further injections of 6 gm. of the drug. On June 21 10 cc. of its blood was injected into monkeys which became infected on June 30.

All four experiments gave similar results. In view of the possibility that the experimental infections were too massive, further observations were made on the effect of driving a herd of 20 cattle, 16 of which were previously treated by an intravenous injection of 8 gm. of " Bayer 205 " through a heavily infested fly-belt (*G. morsitans* and *G. fusca*). The prophylactic injections were given on March 27 and the cattle entered the fly-belt on March 30. On April 6 and 16 further injections of 8 gm. of the drug were given and on April 25 a further injection of 4 gm. On April 17 the animals were removed from the fly-belt. The controls were found to be infected as early as April 12, on which date all the treated animals were free. On May 7, however, 9 of the 16 treated animals were found to be infected. On May 18, 2 were still free, 6 had lost their parasites and in the remaining 8 they were present in small numbers only: all were in good condition. The trypanosomes concerned were *T. brucei, T. vivax* and *T. congolense*.

The authors intend to return later to the subject of the therapeutic value of " Bayer 205 " for infected cattle. In cattle the trypanosomes readily become " Bayer 205 " fast. The susceptibility of the parasites to a drug is in the first degree dependent on the species of animals used and varies with this.

The next section of the report deals with the treatment of sleeping sickness in Rhodesia. Of the six cases referred to in the earlier report, one (the European) relapsed, and died in London [this *Bulletin*, Vol. 20, p. 323]. In June, 1922, the authors treated a further 30 cases, 16 of whom were very ill. The patients were given subcutaneously 3 to 5 injections (according to their condition) each of 1·2 gm. of the drug: the interval between the first and second injection was 10 days and that between the second and third 18 days. One of the patients, an elderly woman, died of pneumonia soon after her arrival at the camp and a middle-aged man died suddenly from unknown cause after the further injection. The remaining patients showed distinct improvement after a few weeks. In all except 2 cases the blood was negative. In October lumbar punctures were made on 21 of the cases (10 formerly very ill, 6 moderately ill and 5 mild cases) and trypanosomes were found in the cerebrospinal fluid of 8 of them. Whether these parasites were in the process of disappearing or whether they indicated a recrudescence of the infection is as yet unknown. They were found in persons who exhibited severe nervous symptoms before treatment; these symptoms had disappeared, six of the patients with parasites in the cerebrospinal fluid looked extremely well and were capable of hard work. Probably the drug is not without influence on the trypanosomes in the brain and even in those situations in the human body where the parasites are not killed they undergo an extraordinary diminution in virulence. At the beginning of November, 1922, the patients were discharged, although some of them were not cured. On April 13, 1923, the Native Commissioner at Lundazi reported that three of them had died; two of these were on the authors' list as dangerously ill and the third died apparently from an abdominal tumour which was noted when the patient was in camp. All the remaining cases are reported to be alive and in good health.

The final section deals with sleeping sickness in the Congo. Diagnosis was made by finding the trypanosomes. Of 32 cases, 24 had trypanosomes in the glands and blood, 4 in the glands only and 4 in the blood only. Lumbar punctures were made in 24 patients, none of whom exhibited nervous signs, and in these the fluid was normal. In all cases with nervous symptoms the spinal fluid contained an excess of lymphocytes even when trypanosomes were not found. As a rule, intravenous injections of 1 gm. of "Bayer 205" in 10 cc. of sterile rain water were given on the first, third and thirteenth days; children were given 0·4 and 0·6 gm. Those who were very ill were given further injections after an interval of 10 days, but not more than five injections in all were given.

The authors treated at Kiambi about the end of December, 1922, 91 cases mostly in the second stage (enlarged glands) and CONZEMIUS treated 40 others at Bukama. Blood examinations were made as far as possible every 8 days. Of 90 cases fairly regularly examined only 2 showed the parasites in the blood up to May 9, 1923, and possibly these were reinfections. Two maniacal patients showed complete disappearance of mental trouble after three injections; seven advanced cases remained in a clinically unsatisfactory state, although trypanosomes disappeared from their blood and in only two of them did parasites remain in the spinal fluid. Dr. WALRAVAENS will continue the observations on these cases and report further in due course. The most important result in the authors' opinion is that, even in cases which show no clinical cures, the blood can be sterilized for long periods. Consequently, if all suspected cases were systematically treated by travelling doctors or sanitary officials, the sources of infection of the fly would disappear and the disease be stamped out over wide areas. Of course, the treatment should go on *pari passu* with improvements of sanitary conditions.

The animals most easily cured are those which are not suffering from natural infections. Thus *T. caprae* in the goat and *T. bovis* (*T. vivax*) in cattle are very resistant. *T. brucei*, really a parasite of the buffalo, has not quite the same resistance in cattle. Human trypanosomiasis is the easiest to cure since man has not harboured the parasites for very long. [This in the reviewer's opinion is a pure assumption with little to support it. The reason why man is more easily cured than cattle can be explained by quite a different hypothesis and one which, in the reviewer's opinion, is much more reasonable.]

W. Y.

DE BUEN (S.) & LUENGO (E.). **Ensayos terapéuticos con el "Bayer 205" en dos casos de tripanosomiasis humana.** [The Use of "Bayer 205" in Two Cases of Human Trypanosomiasis]. *Arch. Inst. Nac. Higiene de Alfonso XIII.* 1923. Aug. Vol. 2. No. 2. pp. 85–96. With 15 charts. [8 refs.]

Two cases of human trypanosomiasis (*T. gambiense*) were treated with "Bayer 205." Judging from the symptoms recorded both were mild or in an early stage. The initial dose was 0·25 gm. and within the first week 3 gm. and 3·5 gm. were given, respectively. The fever disappeared at once, but returned in a fortnight and trypanosomes were again found. Three courses of the drug were given in each case, totalling 17·05 gm. in one patient during a period of seven months, 16·3 gm. in the other during five months. Towards the end of the time during which the patients were under observation there were brief recurrences of fever but no parasites were found on blood examination. Albuminuria, noticed after the initial doses, was not increased in amount by subsequent injections, and, in view of the low toxicity of the drug, the authors are of opinion that the maximum doses recommended as "safe" might be increased without danger. This they intend to try in future cases.

H. Harold Scott.

SEI (Shigemoto). **Ueber den Nachweis von "Bayer 205" in den Organen behandelter Tiere.** [The Demonstration of "Bayer 205" in the Organs of Treated Animals.]—*Arch. f. Schiffs- u. Trop.-Hyg.* 1923. Aug. Vol. 27. No. 8. pp. 257–268.

The conclusions are :—

The investigation of organ extract—obtained by rubbing up the organs with phenol saline solution in a mortar with sand—of guinea-pigs which had received two large doses of "Bayer 205," and had then been killed by bleeding, showed that the drug was present in the various organs in large amount ; the extracts exerted a therapeutic effect on mice infected with *T. equiperdum.*

Renal extracts were most active, then those of the liver and supra-renals, and lastly those of the spleen and lungs. Extracts of brain and bile were completely inactive ; that of the liver was sometimes toxic. Extracts made from 1 to 15 days after administration of the drug were active, but those made after 29 days were inactive.

The observation is not to be explained on the assumption that the drug is present in the blood or serum content of the organs, since the drug is apparently in smaller amount in the circulating blood than in the organs.

W. Y.

RUPPERT (Fritz) **Ueber die Veränderlichkeit des chemotherapeutischen Quotienten von Medikamenten in verschiedenen Tieren.** [On the Variability of the Chemotherapeutic Quotients of Drugs in Different Animals.]—*Arch. f. Schiffs- u. Trop.-Hyg.* 1923. Aug. Vol. 27. No. 8. pp. 273–280. .[2 refs.]

Biological studies of chemical preparations can be conducted only on animals, and conclusions drawn as the results of experiments on small animals do not necessarily apply to the case of the large animals and man. It is possible to cure mice infected with a strain of trypanosomes by a single dose of a drug which is only a fraction of the lethal dose, whereas large animals infected chronically with the same trypanosome cannot be cured by a single dose even when it approaches the lethal amount. There is hence a difference in the action of the drug in acute and chronic infections ; in the latter the parasites are sheltered in some situation in the body from the action of the drug. There are drugs which have an action in chronic infections, although in mouse experiments their chemotherapeutic index is less than that of other preparations. For example, the index of atoxyl in trypanosome infections in the mouse is 1 : 2 to 1 : 3, whereas that of salvarsan is 1 : 10 and that of silversalvarsan 1 : 22 ; nevertheless, atoxyl is more valuable in the treatment of man and the larger animals than are the salvarsan preparations. The reason for this is the drugs are absorbed, changed or excreted differently in different animals. This is another illustration that results obtained from small animals do not warrant conclusions regarding large animals.

The experiments recorded in this paper deal with the chemotherapeutic index of "Bayer 205" in various animals. In mice it was found that the curative dose was to the lethal dose as 1 : 400. Experiments on rabbits showed that the lethal dose was 0·5 to 0·6 gm. per kilo of body-weight, whereas the curative dose for rabbits infected with *T. equiperdum* was 0·05 gm. The chemotherapeutic index then in the case of rabbits is only about 1 : 10. The lethal dose of the drug for horses was found to be about 1 gm. per 50 kilos of body-weight; *i.e.*, the drug is about 25 times as toxic per kilo for horses as it is for rabbits. Experiments to determine, by the usual method, the curative dose in the case of horses infected with mal de caderas are for various reasons unsatisfactory and fraught with considerable difficulties, and in view of this it was decided to examine the prophylactic power of the drug. Eight horses were given quantities of " Bayer 205 " varying from 0·25 gm. to 0·75 gm. per 50 kilos of body-weight, and then after an interval varying from 15 to 51 days injected with *T. equinum.* The results which are set forth in a table show that 0·5 gm. of the drug per 50 kilos is sufficient to protect horses inoculated 15 and 34 days later. The inference is that 0·5 gm. per 50 kilos is the curative dose. In order to demonstrate the curative action of 0·5 gm. of the drug, five chronically infected horses were treated with doses varying from 1 gm. to 0·5 gm. per 50 kilos; the results are given in a table. The chemotherapeutic index for horses infected with mal de caderas is hence only 1 : 2.

W. Y.

BLEYER (J. Clarke). **Ueber eine merkwürdige indianische Behandlungsweise eines Falles von Thyreoiditis parasitaria.** [A Remarkable Indian Method of treating a Case of Parasitic Thyroiditis.]—*Arch. f. Schiffs- u. Trop.-Hyg.* 1923. July. Vol. 27. No. 6. pp. 197–202. [4 refs.]

This paper describes the treatment of a case of Chagas' disease in a mestizo woman sixty years of age, who apparently contracted the infection near Palmeira in Uruguay. The history of the case records that she lived in a hut heavily infested with Triatoma; in the course of time she suffered from a peculiar fever accompanied by a swelling in the front of the neck which within a year assumed monstrous proportions. Infiltration of the face, especially under the eyes, developed, and disturbances of respiration and of the heart's action set in. The patient then came under the care of a native doctor, "Curandeira," who undertook to relieve her of the thyroid tumour. The treatment consisted in heating fat of wild and of domestic fowl on porphyry plates over glowing charcoal and then binding the fat as hot as possible over the swelling. The pain caused by this procedure was extreme; after a few days an opening occurred and material was evacuated, the process being aided by pressure and massage. The flow of inflammatous secretion went on for weeks and the tumour gradually shrank. Fresh aromatic leaves were applied to the wound daily. Internally bitter drugs of unknown nature, possibly allied to quinine, were given and finally " oil of capivara " made from the fat of *Hydrochoerus capivara.* The result is apparently all that could be desired, the fever and respiratory disturbances have gone and the appetite and sense of well-being restored.

W. Y.

MÜNCH (Hubert). **Die Bestimmung des trypanoziden Serumtiters als Leberfunktionsprobe.** [The Determination of the Trypanocidal Titre of the Serum as a Test of Liver Function.]—*Muench. Med. Woch.* 1923. July 20. Vol. 70. No. 29. pp. 945–946. [15 refs.]

Reference is made to previous work on this subject by ROSENTHAL and FREUND and others [this *Bulletin*, Vol. 19. pp. 154, 520, and Vol. 20, p. 337]. The author examined the trypanocidal titre of the serum in

65 cases—37 suffering from diseases of the liver and 28 healthy or suffering from diseases not involving the liver. In the latter group, the titre varied considerably and in the case of two new-born babies was very low; but, on the whole, the 37 cases of the former group exhibited a distinctly lower titre, except in two cases of cancer of the liver and four of very advanced cirrhosis, in which it was almost normal. All these results are, however, of limited value, as the titre of the patient's serum when in health was unknown. The author believes that these experiments throw a light on what seems to be one of the important functions of the liver, but they do not justify the determination of the trypanocidal titre as an aid to diagnosis of hepatic diseases.

W. Y.

LAKE (G. C.) & PROBEY (T. F.). **The Effect of "Arsenic-Fastness" of *Trypanosoma equiperdum* on the Ratios between the Parasiticidal Values of Arsphenamine and Neoarsphenamine.**—*Public Health Rep.* 1923. June 15. Vol. 38. No. 24. pp. 1347-1350. [2 refs.]

The following summary is given:—

"The minimal effective doses of a single lot each of arsphenamine and neoarsphenamine have been determined for three 'arsenic-fast' strains of *Tr. equiperdum* and for one non-arsenic-fast, 'normal,' or possibly arsenic-susceptible strain. All four strains were substrains from the same common strain.

"With the 'arsenic-fast' strains the minimal effective dose for this arsphenamine and neoarsphenamine was found to be about the same and not far from 50 mgm. per kilo, whereas with the 'normal' strain the minimal effective dose for the same arsphenamine was found to be between 3 and 4 mgm. per kilo, and for the same neoarsphenamine about 12 mgm. per kilo.

"No explanation is apparent as to why an 'arsenic-fast' strain should be proportionately less resistant to arsphenamine than to neoarsphenamine."

W. Y.

SWYNNERTON (C. F. M.). **A Critical Summary of the Preliminary Observations on the Sleeping Sickness Outbreak near Mwanza.**—*Trans. Roy. Soc. Trop. Med. & Hyg.* 1923. June 21. Vol. 17. No. 3. pp. 142–150. With 1 map.

This paper is practically a summary of the lengthy article, dealing with the entomological aspects of the Mwanza outbreak of sleeping sickness, published by the author earlier in the year [this *Bulletin*, Vol. 20, p. 311].

W. Y.

MUIJZERT (P. C.). **Enting van Trypanosomen in de voorste oogkamer van** *Cavia cobaya.*—*Tijdschr. v. Vergelijk. Geneesk., enz.* Leiden. 1923. Sept. 26. Vol. 9. No. 3. pp. 222–231. [6 refs.] [English summary p. 229.] [6 refs.]

The author has taken pains to demonstrate that an experimental intraocular infection of guinea-pigs with *Trypanosoma venezuelense, equiperdum, brucei, rhodesiense, gambiense* and *evansi* soon becomes general, and, conversely, that in a general infection trypanosomes of undiminished virulence may be found in the anterior chamber of the eye.

A. Alcock.

MUNK (Fritz). **Die Chagaskrankheit. Bericht ueber eine Expedition in Brasilien.**—*Med. Klin.* 1923. June 10 & 17. Vol. 19. Nos. 23 & 24. pp. 784–788; 822–824.

BLACKWATER FEVER.

BLACKLOCK (B.). **The Etiology of Blackwater Fever.**—*Ann. Trop. Med. & Parasit.* 1923. Apr. 18. Vol. 17. No. 1. pp. 79–87. With 1 chart in text. [6 refs.]

The author summarizes briefly some of the theories which have been advanced regarding the etiology of blackwater fever. CASTELLANI and CHALMERS in the last edition of their text-book separate the haemoglobinurias which may occur in the tropics into three groups, viz.—Symptomatic (*e.g.* malaria), toxic (*e.g.* quinine), and specific (*e.g.* blackwater fever and paroxysmal haemoglobinuria) ; a table gives the various symptoms, which these authors regard as characteristic of the three conditions. Blacklock shows how nebulous the distinctions are. It is commonly stated that blackwater is, owing to its severity, a condition which leaves no doubt as to diagnosis. The author believes, however, that closer investigation will reveal the fact that haemoglobinuria occurs frequently in the tropics without being observed, and that still more frequently haemolysis with slight jaundice occurs without noticeable haemoglobinuria, and that these conditions are in fact frequently due to the same causes as blackwater fever and are mild forms of the same condition. Some term is required for such conditions, to indicate that the process of haemolysis has not produced such a degree of haemoglobinuria as to result in the passage of haemoglobin in the urine. [The author does not state how he proposes that the last condition, *i.e.*, slight haemolysis with slight jaundice, but without haemoglobinuria, should be diagnosed.]

Numerous suggestions regarding the nature of the causal parasite of blackwater fever have been made during the last thirty years. In order to throw some light on the subject blood was taken from the patient at the height of the disease and added to half its volume of citrated salt solution ; 0·6 cc. of this was injected intramuscularly into a healthy individual followed a quarter of an hour later by a further injection of 2 cc. The recipient had previously had subtertian malaria, but had been free from relapse for 18 months and had not taken quinine until the day of the inoculation for over eight months ; to obviate infection with malaria thirty grains were taken during the 21 hours following the inoculation. It might be argued that the quinine might be capable of killing the blackwater organism, but there are numerous cases on record in which large doses of quinine have failed to abate or ameliorate the condition ; also in the case in question quinine was administered intramuscularly on the sixth and seventh days of the disease without any beneficial result. The outcome of this experimental inoculation was negative.

The conclusions are :—

"1. The term 'Blackwater' Fever, being applicable only to conditions in which haemoglobin is present in visible quantity in the urine, is too restricted.

"2. The importance of pre- and post-haemoglobinuria states which are inherent parts of the disease, is apt to be lost sight of owing to the exclusive use of the term 'Blackwater' Fever. Some such term as 'Occult' or 'Subliminal' Blackwater Fever might be used to express these conditions.

"3. A differentiation of Tropical Haemoglobinurias into Malaria, Quinine and specific Blackwater types is not possible merely on the basis of the presence and degree of jaundice, or on the relative severity of the signs or symptoms.

"4. The existence of a parasitic cause of Blackwater Fever has been frequently suggested, an experimental human inoculation, with blood from a severe case of Blackwater Fever which ended fatally, elicited no evidence in favour of the existence of such a parasite after an observation period of two months"

W. Yorke

KLIGLER (I. J). **Studies on the Etiology of Blackwater Fever.**—*Amer. Jl Trop. Med.* Baltimore 1923 May. Vol. 3. No 3. pp. 203–212. [2 refs]

The following summary is given:—

"The series of observations reported in this paper seem to have a bearing on the mechanism of quinine hemoglobinuria It appears that in the presence of bile quinine becomes highly hemolytic even in the small doses normally employed in the treatment of malaria Some as yet undetermined constituent of bile has the power of rendering quinine hemolytic in one-tenth the concentration usually required If we assume that the substance in question is liberated during the active destruction of blood cells in the course of repeated attacks of malaria, a simple theory of the mechanism of hemoglobinuria suggests itself Hemoglobinuria patients invariably give a history of repeated attacks of malaria. In the course of these attacks cells products are constantly liberated in the circulation which may not at times be readily eliminated and thus reach a concentration higher than normal At that time the injection of quinine causes hemolysis and hemoglobinemia which manifests itself by the appearance of hemoglobin in the urine

"Experiments on rabbits carried on thus far have not yielded satisfactory results because of the difficulty of reproducing the exact conditions developed by chance in human beings Hemoglobinuria was produced by the injection of bile but the dose injected bordered on lethality and consequently could not be relied on to give constant results In four experiments mild hemoglobinuria was obtained by the injection of quinine followed by bile.

"It is realized that the observations reported are of a fragmentary character. They are, however, of value in so far as they establish that quinine becomes actively hemolytic even in small doses when acting in combination with bile, a product of destruction of red blood cells

"The experiments are being continued with a view to finding some specific product of blood cell destruction which will increase the hemolytic power of quinine in the same manner as bile and the conditions required to produce hemoglobinuria experimentally in animals."

W. Y.

LOW (George C.) & DUNCAN (J. T.). **The Etiology of Blackwater Fever.**—*Trans. Roy. Soc. Trop. Med. & Hyg.* 1923. June 21. Vol. 17. No. 3. pp. 201–204. [3 refs.]

The blood of a case of blackwater fever on the second day of the disease was examined for spirochaetes, by the method recommended by BLANCHARD and LEFROU [this *Bulletin*, Vol. 20, p. 353], with negative results. Numerous spirochaete-like filaments were observed, however, in the second and third deposits; most of them presented a linear beading and some also terminal thickenings. They moved in the microscope field in a manner entirely unlike spirochaetes; many were attached to platelets, but the actual development of a filament from a platelet was not observed, although there is no doubt that they arise in this way. A great increase in the number of filaments occurred when the fresh microscope preparation was allowed to stand for some time. The bulk of the third deposit was suspended in citrated plasma and inoculated into four guinea-pigs with negative results.

W. Y.

THOMSON (J. G.). **The Common Occurrence of Pseudospirochaetes in the Blood of Blackwater Fever Cases, and of Normal Human Beings and Animals when using the Technique of Blanchard and Lefrou.**—*Jl. Trop. Med. & Hyg.* 1923. Aug. 1. Vol. 26. No. 15. pp. 251–253. [11 refs.]

In this paper, the author records the results of his attempts with the technique of BLANCHARD and LEFROU [this *Bulletin*, Vol. 20, p. 353] to find spirochaetes in the blood of Southern Rhodesian cases of blackwater fever. The blood was obtained at various stages of the disease, viz., on the first, second and third days of the onset and also after the haemoglobinuria had ceased. In every case the centrifuged deposits of the third tube contained numerous pseudospirochaetes of two types, namely, thick motile filaments of from 5 μ to 9 μ in length and longer extremely fine filaments very actively motile measuring from 7 μ to 12 μ in length. These filaments correspond in all respects to those seen in clotted blood from normal individuals; they have no spiral movement, but appear to be actively motile, wriggling and bending on themselves; they are more or less straight filaments without coils or spirals, but occasionally have a beaded appearance suggesting a chain of streptococci. When fixed and stained they are often thrown into coils, thus simulating true spirochaetes, but differing from such in that they do not stain so intensively or so regularly. The author states there is little doubt that the longer filaments originate from blood platelets and the stouter from degenerate or damaged erythrocytes. Inoculation of the centrifuged deposits from 10 cases of blackwater, taken at various periods of the disease, into 10 guinea-pigs failed to produce any symptoms.

The conclusions are :—

> " There is at present no proof that any species of spirochaete or even a special species of spirochaete produces or even predisposes to an attack of haemoglobinuric fever. The whole evidence so far obtained by us in Southern Rhodesia undoubtedly shows in a remarkable manner the relationship of this condition to chronic malignant tertian malaria (*P. falciparum*), which clinically is of the bilious remittent type with occasional cases of coma."

W. Y.

ROBERTSON (G. E.) & MOORE (W.). **Blackwater Fever.**—*U.S. Nav. Med. Bull.* 1923. Oct. Vol. 19. No. 4. pp. 413–415.

The object of this communication is to present the authors' convictions regarding the cause and treatment of haemoglobinuric fever after two and a half years' experience in Haiti, during which period 626 cases of malaria and 13 of blackwater came under their observation. The paper concludes as follows: " It is our belief that blackwater fever is a manifestation of pernicious malaria and should be classed along with the cerebral, algid, bilious, remittent, and other forms of pernicious malaria. We also believe that the administration of intravenous quinine is the most important remedy for its cure."

W. Y.

MACMILLAN (R. J. A.). **Report on Blackwater Fever in Uganda for 1922.**—*Uganda Protectorate Ann. Med. & San. Rep. for the Year ended 31st December, 1922.* pp. 49-52.

During 1922 there were 83 cases of the disease with 14 deaths—7 from suppression, 2 from uraemia and 5 from heart failure. In tables details are given regarding the sex, age and length of residence in the tropics of the various cases. In all cases except one a previous history of malaria is recorded; the malaria was mainly simple tertian. With regard to the question of quinine prophylaxis, it is recorded that quinine was taken regularly by 13 cases, irregularly by 56, not taken by 10, and unknown in 4 instances. Among 23 cases it is recorded that twelve had had 1 previous attack of blackwater, six had had 2, three had had 3, one had had 10, and one an unknown number of previous attacks. The duration of the haemoglobinuria is given in a table.

W. Y.

i. NIGERIA. **Annual Report on the Medical Research Institute for the Year 1919.** [CONNAL (A.), Director.]—20 pp. [Blackwater Fever, pp. 3-11.]

ii. ——. **Annual Report on the Medical Research Institute for the Year 1921.**—14 pp. [Blackwater Fever, pp. 6-11.] 1922. Lagos: Printed by the Govt. Printer.

i. Reports received from medical officers on 28 cases of blackwater during 1919 are analysed. Twenty-six of the patients were Europeans, one was an Eurasian and the other a Nigerian native. Details are given regarding the sojourn in West Africa, the previous malaria, use of quinine, etc. A certain amount of information concerning the onset of the attack was available in 21 of the cases. The average length of the haemoglobinuria was 4½ days, the extremes varying from 2 to 6 days. Eight of the patients died after an illness varying from 2 to 14 days, and clinical particulars of these cases are given in a table. The report closes with records of the result of examination of the blood for malaria parasites.

ii. During the year 1921 reports of 26 cases were received. The duration of the haemoglobinuria varied from 20 hours to 7 days, and the number of fatal cases was eight. The information available regarding these cases is summarised in much the same manner as in the previous report.

W. Y.

DUPUY (L.). **Considérations sur la pathogénie et le traitement des fièvres bilieuses hemoglobinuriques.**—*Ann. Soc. Belge de Méd. Trop.* Brussels. 1923. May. Vol. 3. No. 1. pp. 53-62. [12 refs.]

The author commences his paper by briefly summarizing the various theories which have been advanced regarding the cause of blackwater fever. He concludes that just as the clinical symptoms of the bilious haemoglobinuric fevers are similar, so their pathogenesis is most often the same. This pathogenesis is that of colloidoclasia of WIDAL (accidents colloïdoclassiques). Proteintherapy is called to play a great part in the treatment of these diseases.

From the point of view of prophylaxis it is important to insist more particularly:—

1. On the importance of testing the effect of increasing doses of quinine on future colonials before their departure from Europe.
2. That Europeans should take regularly daily doses of quinine during their sojourn in the Colonies.
3. On the importance of avoiding chills.
4. On the rational division of the therapeutic doses of quinine and on the oral administration of peptone previously in anaemia, or very debilitated and sensitive subjects.

W. Y.

YOUNG (W. A.). **A Theoretical Suggestion as to the Cause of So-called "Blackwater Fever" and a Few Notes on Treatment and Prophylaxis.**—16 pp. 1922. Lagos: Printed by the Govt. Printer. [Price not stated.] And *Jl. Trop. Med. & Hyg.* 1923. Dec. 1. Vol. 26. No. 23. pp. 349–355.

The conclusions are as follows:—

"(1) The presence of polychromatocytes is of great diagnostic value as to the presence of obscure malaria.

"(2) 'Blackwater Fever' is not a disease *per se* but only a complication of a severe infection of malaria. This complication which might occur, and sometimes does if the patient can survive, otherwise is made premature by the exhibition of a certain dose of quinine usually larger than the patient is accustomed to take. Its action on the large number of severely poisoned cells accounts for the 'Malarial Haemoglobinuria.'

"(3) To prevent Malaria, prophylactic quinine must be used scientifically and not indiscriminately.

"(4) Any change in the environment or individual health may alter the prophylactic dose required.

"(5) Quinine is the only remedy for subtertian malaria at present of any value.

"(6) So-called 'Blackwater Fever' is a blot on the intelligence of the community and should never be seen under normal peace conditions.

"(7) Any factor *which impairs the body's efficiency* may turn a not too severe attack of malaria into one of malarial haemoglobinuria."

W. Y.

BALL (Ernest). **Eleven Cases of Blackwater Fever with Eleven Recoveries.**—*Jl Amer. Med Assoc.* 1923 June 23 Vol 80. No. 25. p 1847

HALL (G Rome). **"Blackwater," a Disease of Metabolism.**—*Jl. Trop. Med. & Hyg.* 1923 Apr 16. Vol 26. No 8. pp 119–123.

KUTTNER (L) & LOEWENBERG (W) **Malaria und Schwarzwasserfieber.**—*Deut. Med. Woch.* 1923. Aug. 17. Vol. 49. No. 33. pp. 1080–1081. [13 refs.]

PLAGUE.

ROBERTSON (H. McG.). **A Possible Explanation of the Absence of Bubonic Plague in Cold Countries.**—*Public Health Rep.* 1923. July 6. Vol. 38. No. 27. pp. 1519–1531. [1 ref.]

It will suffice to give the author's conclusions, supported, in a long paper, by several tables of statistics :—

" (1) Bubonic plague is essentially a disease of hot climates, and, having been introduced into tropical countries, it tends to persist indefinitely.

" (2) Outside of the immediate Tropics, this disease is rather definitely limited in the extent to which it will spread. [?]

" (3) In countries with a mean midwinter temperature of 45° F. or below, bubonic plague is occasional, accidental and distinctly self-limited, and it seems possible for it to occur in the colder regions only for short periods under unusual conditions. [? Russia, Siberia, etc.]

" This study appears to me to sustain the deduction that the seasonal prevalence of fleas regulates the spread of bubonic plague ; otherwise it becomes necessary to find at least some equally reasonable explanation for the absence of bubonic plague in cold countries."

J. H. Tull Walsh.

TANON (L.). **Le rat reservoir de virus pour la peste.**—*Congrès de la Santé Publique et de la Prévoyance Sociale, Marseille,* 11–17 *Septembre* 1922. *Comptes Rendus.* pp. 249-254.

These experiments show that true rat carriers, healthy animals, contain plague bacilli with attenuated virus, from which source virulent infection may arise under favourable conditions.

J. H. T. W.

NEILSON (H. R.). **Plague Epidemic, Kampala, 1922.**—*Uganda Protectorate Ann. Med. & San. Rep. for the Year ended 31st December, 1922.* pp. 66–68.

An official report of an outbreak of plague and the methods of treatment and sanitation. The final paragraph may well be quoted as of good omen :—

" In addition to the above, a plentiful supply of fresh vaccine, and with a few exceptions, whole-hearted co-operation of all residents, official and non-official, in helping me to carry out measures necessary in my opinion to stop the spread of the disease, have been factors, in the absence of which, a very serious epidemic must have been the result."

[See this *Bulletin,* Vol. 20. p. 357 (VASSALLO).]

J. H. T. W.

MARSHALL (Claude H.) & RAM (Achhru). **Treatment of Plague by Neokharsivan.**—*Uganda Protectorate Ann. Med. & San. Rep. for the Year ended 31st December, 1922.* pp. 68–69.

During the outbreak recorded by NEILSON [above] four cases of bubonic plague were successfully treated with Neokharsivan ; 0·6 gm. for an adult ; 0·4 gm. for a child of 12 ; and only one injection was given. Three more cases were treated subsequently. In one serious case, delirious for seven days, two injections of 0·6 gm. were given intravenously with an interval of 48 hours ; 1·0 cc. tincture of iodine was injected into the bubo on the second day and adrenalin ♏ vii injected daily for three days until the diarrhoea stopped. Recovery was uninterrupted, except for the breaking down of the bubo. Case 2 also recovered. The third case showed blood from the finger full of *B. pestis* and the woman, ill for three days before coming to hospital, was collapsed. She received an injection of neokharsivan, but died a few hours after admission.

J. H. T. W.

TSURUMI (M.), HARA (C.), IMAI (M.), AWOKI (T.) & SAKAMOTO (T.). **An Investigation of Pneumonic Plague.**—*Japan Med. World.* Tokyo. 1923. July 15. Vol. 3. No. 7. and Aug. 15. No. 8. pp. 153-160; 181-187.

A detailed examination of pathological material supplied by the epidemic prevalent in Manchuria 1920–1921. The authors state that no plague bacilli were found in the gall bladders of the cases examined. They also write :—" We cultured plague bacilli in the bile of a cow to see the growth, but instead of growing the bacilli seemed to be dissolved out gradually." The August number contains routine laboratory work on infection, agglutination, etc.

[For references to this epidemic see this *Bulletin*, Vol. 19, p. 372 (WU LIEN TEH), and Vol. 20, p. 358 (CHUN).]

J. H. T. W.

LEGER (M.) & BAURY (A.). **Vaccination contre la peste par la voie buccale.**—*Bull. Soc. Path. Exot.* 1923. July 11. Vol. 16. No. 7. pp. 469–475. [11 refs.]

The authors refer to previous work and then give details of a series of experiments on rabbits, guineapigs and monkeys. The bile sensitized vaccine of BESREDKA was used since this is the only form of vaccine likely to be absorbed from the intestines. They state that they admit that immunization of laboratory animals may be obtained by buccal administration of killed cultures after these animals have been previously prepared with doses of ox-bile. The table gives full details and results for guineapigs and monkeys :—

ANIMAUX.	VACCINATION.	INOCULATIONS VIRULENTES.		
	20, 22, 24, 26, 28, fevrier.	10 mars. (10° jour).	20 mars. (20° jour).	10 avril. (40° jour).
Cobaye 30	3 cm^3 bile + 3 cm^3 vaccin	Résiste	.	.
Cobaye 33	1 cm^3 bile + 3 cm^3 vaccin	Résiste	.	..
Cobaye 48	..	Mort 3 jours	.	.
Cobaye 49	..	Mort 5 jours	..	..
Cobaye 35	1 cm^3 bile + 3 cm^3 vaccin	..	Résiste	..
Cobaye 37	1 cm^3 bile + 3 cm^3 vaccin	.	Résiste	..
Cobaye 59	.	..	Mort 5 jours	
Cobaye 60	..	..	Mort 8 jours	..
Cobaye 32	3 cm^3 bile + 3 cm^3 vaccin	..		Résiste
Cobaye 36	1 cm^3 bile + 3 cm^3 vaccin	..		Résiste
Cobaye 34	1 cm^3 bile + 3 cm^3 vaccin	.	.	Mort 7 jours
Cobaye 65	..	..	..	Mort 3 jours
Cobaye 66	..	..	..	Mort 5 jours
Singes :				
Patas	3 cm^3 bile + 5 cm^3 vaccin	Résiste	.	..
Callitriche	.	Résiste	.	..
Cynocéphale	3 cm^3 bile + 5 cm^3 vaccin	..	Résiste	.
Patas	..	..	Mort 15 jours	..
Callitriche	3 cm^3 bile + 5 cm^3 vaccin	..	..	Résiste
Callitriche	..	..	..	Mort 18 jours

J. H. T. W.

BOMBAY. **Report of the Bombay Bacteriological Laboratory for the Year 1922.** [MACKIE (F. P.). Offg. Director].—15 pp. With 1 chart. 1923. Bombay: Government Central Press. [Price Rs. 0.4.6.]

The report for 1921 was noticed in Vol. 20 of this *Bulletin*, p. 364, so that it is only necessary to state that during 1922, 972,037 doses of anti-plague vaccine were issued to the various Presidencies, Native States, etc. The largest number of doses—306,822—went to the Madras Presidency. 755,938 rats were sent to the laboratory for examination. Of this number 276,408 were alive and 479,530 dead when received. Of this latter 344,546 were examined and 6,404 (1·9 per cent.) were found infected with plague. Tables of human and rat mortality for 1922 are given.

J. H. T. W.

BOUFFARD (G.) & GIRARD. **Le dépistage de la peste par la ponction du foie. Son importance prophylactique.**—*Bull. Soc. Path. Exot.* 1923. July 11. Vol. 16. No. 7. pp. 501-523. (Discussion. pp. 523-524.) [6 refs.]

This method refers to the detection of plague in dead bodies, bodies perhaps found dead or those of persons dying with the disease not strictly diagnosed. The investigations were carried out over a period of 20 months in Madagascar. Puncture of the liver does not require any incision and post mortem examinations are disliked by the natives. A puncture of the liver is not objected to. The results from 3,500 punctures show that the plague bacillus is easily recognized and is not liable to be confused with any other germ. Among the living puncture of the liver has also been employed for diagnosis. One of the authors had a case in which the patient, a woman, was brought to hospital at 10 a.m. and died five hours later. Diagnosis of plague was secured at once by a puncture made on admission. In another case simple puncture of the liver detected plague in a patient who had been under treatment for typhoid fever for five days.

J. H. T. W.

OHOTO (Osamu). **On the *B. pestis* in Blood and its Cultivation.**—*Japan Med. World.* Tokyo. 1923. June 15. Vol. 3. No. 6. pp. 136-137.

The author working at the Isolation Hospital, Osaka, failed in finding *B. pestis* in smears taken directly from plague cases. He therefore inoculated the blood into bile media as used by CONRADI and KAYSER. He also employed bouillon with 1·0 per cent. sodium citrate. His results were satisfactory and show that with these media 72·2 per cent. of the patients examined gave positive results. He considers that plague septicaemia is not so rare as supposed.

B. pestis in the blood disappears as early as two days and at the latest after 10 days. Thus, in mild cases, if present, the organism disappears quickly from the blood and in severe cases where the prognosis is bad the organism appears to remain in the blood until death.

J. H. T. W.

GUINON, DE PFEFFEL & LAMY. **Un cas de septico-pyohémie mixte à bacilles de Yersin et à pneumocoques d'évolution subaiguë.**—*Bull. et Mém. Soc. Méd. des Hôpit. de Paris.* 1923. Aug. 2. 3rd Ser. Vol. 39. No. 27. pp. 1259-1264. [5 refs.]

No case of plague had been admitted to the Bretonneau Hospital for two years until the case here reported, and another in a child, a case of simple plague, were diagnosed [see this *Bulletin,* Vol. 17, p. 392 (Guinon, etc.); and Vol. 18, p. 348 (Teissier, etc.)]. The first case mentioned above is given in full detail. The patient, a child of 12 years, died of pyaemia and plague. A mouse inoculated with pus from the inflamed glands of the neck died in six days. A guineapig and a mouse inoculated from a culture of the mixed germs showed in their blood and organs both *B. pestis* and the pneumococcus.

J. H. T. W.

Villazon (Nestor Morales). **Bactériophage efficace contre le bacille de la peste.**—*C. R. Soc. Biol.* 1923. Oct. 13. Vol. 89. No. 27. pp. 754–756.

A culture, obtained from the spleen of a rat, resembling somewhat that of *B. coli* showed after three days certain spots where lysis was taking place and finally the colony disappeared. The material removed from the marked spots was sown in three tubes of bouillon; after 24 hours at 37° C. the liquid was passed through a Berkefeld filter. Details are then given of the effects produced with the microbe X.

The plague bacilli of infected wild rats were then studied. The culture filtrates in two cases produced lytic " plaques " in the cultures of a Yersin's bacillus (type Bachmann I). On the 14 July two rats had been inoculated with this plague bacillus, the bacteriophage being added for one of the rats. They both died on the 17th, and in the latter fewer *B. pestis* and fewer lesions were found than in the other one.

[This work needs confirmation and no doubt others will repeat the investigation—see this *Bulletin,* Vol. 17, p. 396 (d'Herelle), also *Sanitation Supplement,* No. 3, Oct. 1923, p. 182 (Bacteriophages)].

J. H. T. W.

i. Renaud (H. P. J.). **La peste au Maroc: étude d'épidémiologie et de géographie médicale.**—*Rev. d'Hygiène.* 1923. Mar. Vol. 45. No. 3. pp. 193–215. With 3 figs. [13 refs.]

ii. Hirst (L. Fabian). **On the Spread of Plague in the East Indies.**—*Trans. Roy. Soc. Trop. Med. & Hyg.* 1923. June 21. Vol. 17. No. 3. pp. 101–123. (Discussion. pp. 123–127.)

iii. Zabolotny (D.). **Les épidémies de peste en Russie, au cours de ces dernières années.**—*Bull. Soc. Path. Exot.* 1923. July 11. Vol. 16. No. 7. pp. 467–469. [6 refs.]

iv. Lethem (William A.). **The Epidemiology of Bubonic Plague in Great Britain, with Special Reference to its Spread by "** *Pulex Irritans.*"—*Jl. State Med.* 1923. Nov. Vol. 31. No. 11. pp. 508–515. [11 refs.]

v. Reenstierna (J.). **Essais de vaccination préventive par l'emploi des cultures mortes du bacille de Ducrey contre l'infection streptobacillaire et la peste.**—*Arch. Inst. Pasteur de Tunis.* 1923. July. Vol. 12. No. 2. pp. 249–252. [3 refs.]

vi. Le Dantec. **A propos du traitement de la peste.**—*Congrès de la Santé Publique et de la Prévoyance Sociale, Marseille, 11–17 Septembre, 1922. Comptes Rendus.* pp. 246–249.

vii. Heckenroth (F.). **La Prophylaxie et le traitement de la peste dans les Colonies francaises.**—*Congrès de la Santé Publique et de la Prévoyance Sociale,' Marseille, 11–17 Septembre,* 1922. *Rapports.* pp. 277–313. [1 ref.]

i. The author reports that since 1912 plague has been present every year in some part of Morocco, with a serious epidemic in 1911. He gives a map showing the routes along which the infection spread and an ethnographical map.

ii. Contains a good account of reasons for the spread of plague in India, etc.; based on work already noticed in this *Bulletin*, Vol. 20, pp. 359-360. [*Cf.* CRAGG & SWAMINATH, Vol. 20, p. 798.]

iii. *V.* this *Bulletin*, Vol. 20, pp. 357-359 (DOBREITZER, ZABOLOTNY, etc.).

iv. An interesting account of outbreaks of plague, in Great Britain, compiled from many sources.

v. These experiments, described in detail, were carried out at the Pasteur Institute, Tunis, and at the Rabta Hospital, Tunis. The results were negative for men, monkeys and in the plague infection experiments for guinea-pigs; no immunity was obtained.

vi. Refers to the treatment of cases of plague during epidemics in Dakar, 1918 to 1922, already noticed in this *Bulletin*.

vii. Useful and interesting but the paragraphs referring to the separate Colonies cannot be condensed.

J. H. T. W.

ILVENTO (A.). **Alcuni rilievi sull' epidemiologia e sulla cura della peste bubbonica.** [On Epidemiology and Treatment of Bubonic Plague.]—*Policlinico.* Sez. Prat. 1923. Oct. 22. Vol. 30. No. 43. pp. 1391–1392.

REES (William). **The Black Death in England and Wales, as exhibited in Manorial Documents.**—*Proc. Roy. Soc. Med.* (Sect. of History of Med.). 1923. Oct. Vol. 16. No. 12. pp. 27–45. With 1 chart. [Refs. in footnotes.]

WILLIAMS (C. L.) & KEMMERER (T. W.). **Plague-Infected Rats without Visible Lesions. The Discovery of Bubonic Plague only in Rats without Lesions or with Obscure or apparently Trivial Lesions, after Subsidence of Two Recent Epizootics.**—*Public Health Rep.* 1923. Aug. 17. Vol. 38. No. 33. pp. 1873 1881. [8 refs.]

CHOLERA.

SANARELLI (G.). **Patogenesi del colera (VII Memoria). Vie d'ingresso e d'egresso dei vibrioni colerigeni nell'organismo animale.** [Pathogenesis of Cholera.—Entrances and Exits of Vibrios.]—*Ann. d'Igiene.* 1923. July. Vol. 33. No. 7. pp. 457–490. [47 refs.]

1. In rabbits, as in adult guinea-pigs, vibrios injected into the peritoneal cavity pass rapidly into the blood and thence, in a very short time, into the walls of the intestines.

3. The gastric contents of adult guinea-pigs and rabbits are so acid that the bacilli administered by the mouth are quickly killed.

4. Vibrios placed on the buccal mucous membrane of rabbits can traverse the epithelium; they reach the intestinal walls either by way of lymph or blood circulation; old cultures rich in spheroidal forms seem indispensable to success in these experiments.

10. In adult rabbits the respiratory mucous membrane is easily permeable by cholera vibrios.

[For references to previous Memoirs see this *Bulletin*, Vol. 19, p. 736.]

J. H. Tull Walsh.

SANARELLI (G.). **De la pathogénie du choléra (huitième mémoire). L'algidité cholérique.**—*Ann. Inst. Pasteur.* 1923. Sept. Vol. 37. No. 9. pp. 806–836. [27 refs.]

The greater part of this memoir is taken up with the possible origin of algidity and actual production of a similar state in guineapigs by injections of *B. coli* into the blood together with injections of *V. cholerae* into the peritoneum. The "Colitoxin" is given six or seven hours after the infection with vibrios. The author states :—

> The number of points of contact that one finds between the symptomatology and the anatomic lesions in this kind of algidity obtained experimentally in guineapigs, and the algid state observed in human cholera, permits, so it seems to me, to class, from now, cholera algidity among the anaphylactic phenomena. Algidity would only be a brusque access after a preparatory phase of sensitization or incubation, represented by the simple and direct action of the vibrios on the mucous membrane of the intestine and then set going by the joint action, as unexpected as it is indispensable, of other microbes, or their proteid. These are, as a rule, *B. coli*, staphylococcus, etc., temporary, but nearly always habitual, inhabitants of the lymphatics of the alimentary canal. Following upon the enteritic action of the vibrios, these others are roused and become exalted in virulence pouring into the blood their antigen and invading, very often, the different viscera.

J. H. T. W.

TODA (T.). **Cholera and the Ship "Cockroach."**—*Jl. of Hyg.* Aug. Vol. 21. No. 4. pp. 359–361. [8 refs.]

The author examined the faeces of cockroaches which had previously ingested cholera cultures, to determine how long the vibrios were capable of surviving in the intestines of the insects. The cockroaches belonged to the species *B. germanica* and were collected from Japanese liners. Each insect was kept in a test-tube plugged with cotton wool until it became hungry, usually one to three days, in a few cases seven. It was then transferred to a tube containing bread soaked in an emulsion of *V. cholerae.* Females carrying egg cases refused the food, the rest ate it greedily. Out of 94 insects evidence of living vibrios in the faeces or in the intestines after death (killed) was obtained in 14, about 15 per cent. The cockroach must be considered as a possible carrier of infection on ship-board or elsewhere.

J. H. T. W.

NOMURA (Teiichi) & NAGASHIMA (Manabu). [**On the Relation between Cholera Carriers and Prophylactic Inoculation.**]—*Osaka Ig. Kw. Z.* 1921. Vol. 20. pp. 201–206. [Summarized in *Japan. Jl. Med. Sciences.* Tokyo. 1922. Vol. 1. No. 2. pp. 169 and 202.]

These abstracts contain figures showing :—(1) that the total number of segregated persons exposed to infection during the cholera epidemic in Osaka city in 1921, was 2,371. Of 22 it could not be said with certainty that they had received prophylactic anti-cholera inoculation. The non-vaccinated were 1,688 of whom 340 (20·14 per cent.) took infection and 57 (3·38 per cent.) were carriers. Out of 661 vaccinated persons 43 were infected (6·51 per cent.) ; 13 (1·97 per cent.) were carriers, and 609 proved immune. The abstract on p. 202 refers to the same epidemic and the same statistics.

J. H. T. W.

GLOTOFF (E.). **De l'immunisation contre le choléra par voie buccale.**—*C. R. Soc. Biol.* 1923. July 7. Vol. 89. No. 24. pp. 368–369. [1 ref.]

This paper refers to experiments on rabbits :—Ten fasting rabbits received for three following days doses of killed cholera vibrios, by the mouth ; ten other rabbits previously sensitized with ox-bile received by the mouth similar quantities of killed vibrios. Then, at intervals varying from 5 to 48 days the 20 rabbits were inoculated with a lethal dose of *V. cholerae* in the marginal vein of the ear. All the non-sensitized rabbits died. Of the 10 bile-sensitized rabbits 7 survived ; 1 died from an accidental cause ; the other 2 lived from 2 to 5 days longer than any of the first group. This immunity appears about the fifth day and may exist even on the 45th day. It appears to be established without the formation of antibody, and to be local in the intestinal tissues. [*Cf.* this *Bulletin,* Vol. 20, p. 372 (ZABOLOTNY) ; also Vol. 19, p. 737 (MASAKI)].

J. H. T. W.

GAMALEIA. **[De l'entérovaccination dans le choléra.]**—*Prophylactitchesk. Mediz.* 1922. Nov.-Dec. Nos. 4 & 5. pp. 14–18. [Summarized in *Bull. Inst. Pasteur.* 1923. Sept. 15. Vol. 21. No. 17. p. 696.]

The vibrios, grown on bouillon, are killed at 120° and then kept at laboratory temperature for a fortnight thus augmenting the toxicity of the liquid. The liquid is next distilled over a fire and the product precipitated with a solution of phospho-molybdic acid. The vaccine passes into the precipitate as " choleramine " removed by trituration with baryta. The excess of barium is then removed with sulphuric acid.

Experiments were made by feeding guinea-pigs, pigeons and rabbits with the vaccine. The blood of these animals did not show any of the usual immunity reactions. The immunity is stated to be acquired as a mass action without any incubation period.

All other vaccines passed into the intestines, except that of BESREDKA, failed to give any positive result.

J. H. T. W.

KABELÍK (J.) & FREUDMANN (S.). **Ueber den Einfluss von Salzen auf die Vibrionen der Cholera asiatica.** [Influence of Salts on *V. cholerae.*]—*Cent. f. Bakt.* 1. Abt. Orig. 1923. July 25. Vol. 90. No. 6. pp. 407-413. [3 refs.]

The authors felt that it was necessary to explain and reconcile the widely differing figures given by authors for the optimum NaCl content of satisfactory culture media for *V. cholerae.* They quote SIERAKOWSKI who gives 0·5 per cent. as the optimum, and BEAUVERIES who decided upon 3 per cent. NaCl as the optimum. Drs. Kabelík and Freudmann conclude, as the result of detailed experiments, that any difference in useful salt content is due to difference in alkalinity of the culture medium employed. For their experiments they used 2 per cent. peptone-water, ordinary bouillon, agar and gelatine. In each series of experiments the reaction of the medium was from weakly acid to strongly alkaline and the amount of NaCl added varied from 0–6 per cent. They give several detailed tables. They conclude that 3 per cent. is more useful than 0 5 per cent.; but that there is a standard relationship between the P_h of the culture medium and the optimum salt content for particular bacilli. Generally the greater the alkalinity, the lower is the optimum NaCl content.

J. H. T. W.

i. OYAMA (Seiichi). **[On the Diastatic Fermentation presented by the Group of Bacteria of** *Vibrio cholerae* **and on Cholera Red Reaction.]**—*Eisei. Densen. Z.* (*Jl. of Hyg. & Infect. Dis.*) Tokyo. 1921. Vol. 17. pp. 30–41. [Summarized in *Japan. Jl. Med. Sciences.* Tokyo. 1922. Vol. 1. No. 2. p. 171.]

ii. KAWAI (Nawoji). **[On the Efficacy of Hydrochloric Acid Cholera Vaccine.]**—*Ibid.* 1923. Jan. Vol. 18. Nos. 2 & 3. [Summarized in *Japan Med. World.* Tokyo. 1923. July 15. Vol. 3. No. 7. pp. 166–167.]

i. The group produces a strong diastatic ferment of use for identification. A more remarkable red reaction occurs in peptone water with starch than in normal peptone water. [*V.* this *Bulletin* Vol. 19. pp. 380–381 (KODAMA).]

ii. A vaccine for protection of animals prepared by mixing 0·136 per cent. HCl with the vibrio suspension, neutralized with normal caustic soda solution, gave as good results as a vaccine killed by heat.

J. H. T. W.

i. NOBECHI (Keizo). **On Two Strains of Cholera Vibrio showing no Motillity.**—*Scientific Reports from Govt. Inst. for Infect. Dis.* Tokyo. 1922. Vol. 1. pp. 75–77. [6 refs.]

ii. —— & ISHIKAWA (Tomoji). **On the Cholera Strains encountered in Japan in 1921.**—*Ibid.* pp. 79–82. [6 refs.]

i. A well-known condition especially in old cultures.

ii. The authors state that the 12 strains examined reveal nothing new in microscopical, cultural or biological features. [*Cf.* this *Bulletin* Vol. 20. p. 739 (SHIIBA & USHIJIMA).]

J. H. T. W.

HARADA (Shiro). [**On Cholera Cases and Cholera Carriers.**]—*Jyuzenkw Z. Kanazawa.* 1921. Vol. 26. pp. 16–30.

——[**On Cholera Carrier and the Consistency of Cholera Feces together with the Duration of passing out Cholera Vibrios.**]—*Ibid.* pp. 298–315.

NAKADATE (Kokichi). [**A Contribution to the Knowledge of Isolation of** *Vibrio Cholerae*, **with Special Reference to Cholera Carriers.**]—*Saikin Z. Tokyo.* 1921. pp. 219-226.

NOMURA (Teiichi), HOKAMA (Gemcho) & HARADA (Shiro). [**On the Cholera Epidemic in Osaka City in 1920.**]—*Eisei. Densen. Z.* Tokyo. 1921. Vol. 17. pp. 338–357.

SUZUKI (Tsugiwo). [**On the Longevity of** *Vibrio cholerae* **attached to Silk when it is kept in a Dry Vessel.**]—*Ibid.* pp. 104–111.

YAMANOUCHI (Tatsuma). [**On the Agglutinability of** *Vibrio cholerae.*]—*Ni. Biseibutsu. Gak. Z.* Kyoto. 1921. Vol. 15. pp. 1–15.

[The preceding six papers are summarized in the *Japan. Jl. Med. Sciences.* Tokyo. 1922. Vol. 1. No. 2. pp. 169, 170 and 171].

ENTERIC FEVERS IN THE TROPICS.

MELNOTTE (P.). **Quelques observations d'affections typhoïdes chez les noirs.**—*Arch. Instituts Pasteur de l'Afrique du Nord.* 1923. May. Vol. 3. No. 2. pp. 146–150. With 1 chart. [1 ref.]

The author describes, in detail, 13 cases of enteric fever among natives of Senegal and other parts of the West Coast of Africa. They were treated in the hospital at Morocco. Besides the clinical evidence diagnosis was confirmed by the isolation of EBERTH's bacillus in 12 cases and *B. paratyphosus* in 1 case. Eight patients died, including the case of paratyphoid, and it is important to note that at the autopsy of fatal cases several intestinal parasites were found. Case II.: Ascaris in the small intestine; two small perforations in the ileo-caecal region. Case III.: *Ent. histolytica* and Tetramitus. Case V.: eggs of Ancylostoma and Trichocephalus. Case VI.: a *Taenia saginata*. From the etiological point of view it is recorded that all the patients had been less than one year in Morocco. Vaccination with anti-enteric vaccines is recommended in all cases where a native is transported to a new climate or to any region where typhoid is endemic [*cf.* DE LA COMBE].

J. H. Tull Walsh.

DE LA COMBE (Judet). **Note sur la fièvre typhoïde et la vaccination antityphoïdique chez les tirailleurs sénégalais en Algérie.**—*Ann. de Méd. et de Pharm. Colon.* Paris. 1923. Jan.-Feb.-Mar.-Apr. Vol. 21. No. 1. pp. 77–81.

This paper is interesting because of the hypothesis with which it opens:—

> Enteric fever has always been considered extremely rare among natives of West Africa, so much so that its occurrence was not admitted and a natural immunity implied. For this reason antityphoid vaccination was not carried out among native Senegalese troops.
>
> Since our arrival in Algeria in May, 1919, up to July, 1921, the Senegalese troops of Algiers-Tunis, varying from 12 to 18 battalions, had not shown a single case of typhoid fever.
>
> In July, 1921, 900 recruits from the Cameroon were added to the 136th battalion in Algiers and to the 15th regiment at Philippeville.

On the day of arrival at Philippeville (July 11) one man was admitted to hospital. He died on August 31 with sero-diagnostic proof of Para B infection. Up to September 5 there were five cases with two deaths, two giving Eberth's bacillus, one positive for Para A, one positive for Para B.

The sanitary condition of Philippeville was bad and there was an epidemic of typhoid among the civil population. Between July 21 and August 31, 191 cases were reported.

The detachment sent to the 136th, at Algiers, presented 8 cases with 3 deaths; 6 gave blood cultures of *B. typhosus* and 2 blood cultures of Para. A. The civil population were suffering also.

J. H. T. W.

BESREDKA (A.). **L'expérience de La Flèche. A propos de la vaccination antityphique.**—*C. R. Soc. Biol.* 1923. July 7. Vol. 89. No. 24. pp. 366–367.

In an outbreak of typhoid fever at the military college, La Flèche (Sarthe), there were 43 cases with 2 deaths in ten days (April 8–18).

An Inspector General, sent to investigate, ordered anti-enteric vaccination. Two hundred and sixty-eight pupils were considered unfit subjects for subcutaneous inoculation and to these was given a bile-sensitized vaccine by the mouth on April 22, 23 and 24. Two hundred and fifty-three received a "T.A B." vaccine subcutaneously on April 19 and 20. The epidemic continued until May 5 and 5 cases occurred in 11 days among the pupils who received buccal vaccination. Among the group inoculated 10 cases occurred during 20 days. All these cases were mild and no death occurred. The author concludes that: (1) "Vaccination by the mouth with a bile-vaccine is harmless and at least as efficacious as the subcutaneous vaccination."

J. H. T. W.

CORNWALL (J. W.). **The Possibility of Latent Infection with** *B. typhosus.*—*Indian Med. Gaz.* 1923. Aug. Vol. 58. No. 8. pp. 374–375.

Refers to a rabbit inoculated intravenously, Sept. 21, 1922, with 1/10 agar slope of *B. typhosus.* Six days later the bacillus was recovered from its heart blood. The animal gained weight and showed an agglutination titre varying from 1 in 10 and 1 in 280 to 1 in 1,280. After 34 weeks the animal sustained a fracture of the left femur and died a week later. Post-mortem examination showed that the heart's blood was sterile; but *B. typhosus* was found in the bile, jejunum, liver and spleen.

J. H. T. W.

PIJPER (Adrianus). **Widal versus Complement-Fixation.**—*S. African Med. Rec.* 1923. Feb. 10 & 24. Vol. 21. Nos. 3 & 4. pp. 51–62; 74–84. [64 refs.]

Dr. Pijper set himself: (1) to establish the diagnostic value of Widal's test in typhoid fever as seen in Pretoria; (2) to try and assign a cause for the frequently negative Widal in such cases; (3) to introduce a more satisfactory method for the serological diagnosis of typhoid fever. He investigated 120 cases and used 61 strains of typhoid bacilli isolated from them, as well as 5 more strains isolated from Pretoria patients on other occasions; one from a liver or gall bladder abscess; one isolated from surface water; and one obtained from the South African Institute for Medical Research, and also, besides this living material, suspensions of dead typhoid bacilli and allied bacteria series of which were obtained from the Standards Laboratory, Oxford, and from the Central Laboratory tor Public Health, Utrecht.

Dr. Pijper concludes that Widal's test had better be discarded because its frequent failure can be ascribed only to inherent defects of the method which cannot be remedied.

The best way to prove typhoid infection is by recovery of typhoid bacilli from the patient, but difficulties met with in practice will always prevent general adoption of this method; moreover negative results of blood or urine culture would not exclude typhoid infection. This is especially the case with inoculated people and the isolation of typhoid bacilli from stools that are not quite fresh is a nearly impossible task.

In Dr. Pijper's hands the *Complement fixation test* proved to be a diagnostic method vastly superior to Widal's test. His table of results shows that complement fixation gave a positive result in numerous instances where the Widal failed. Total number of samples tested 199; total number of "positives" 192 or 96 per cent. Out of the total 120 "first samples" taken from the 120 patients 115, or 96 per cent., proved positive. Out of the 120 patients only one was never positive with the complement fixation test. Sixty controls were performed on blood samples from cases suffering from all sorts of affections—there were no positives. Comparison of results with Widal and C.F.T. gives some support to the view that agglutinins denote "protection" while sensitizers are evidence of "infection." The strength of the C.F.T. in typhoid does not allow of any conclusions as regards condition of patient or prognosis. The fixation of complement as occurring in some sera is a transient phenomenon, and unless special precautions are taken it is easily missed even by an otherwise very competent observer.

The author discusses very fully the preparation of antigen and under the headings (1) *Preparation of haemolytic system*; (2) *Titration of antigen*; (3) *The test proper, including reading of results,* he gives a complete and careful description of his technique, which is not susceptible of any useful summary and therefore must be sought in the original paper.

Forty persons who had been inoculated against typhoid were subjected to a C.F. test at the same time. Results were negative in 35: of the other 5 who were positive, 3 gave a history of having had typhoid fever. Further research on this matter is necessary.

The following are the formal conclusions of a paper which bears clear and detailed witness of the high standard of technical precision and the exacting controls set and rigidly adhered to :—

1. Widal's is an unsatisfactory method for diagnosing typhoid fever in Pretoria, for it is very often repeatedly negative in undoubted cases of typhoid fever.
2. Pretorian typhoid does not in any respect differ from ordinary typhoid.
3. Paratyphoid is practically non-existent in Pretoria.
4. The bacillus which causes typhoid fever in Pretoria cannot be differentiated from the bacillus that causes typhoid elsewhere.

The failure of Widal's test in Pretoria (5) cannot be due to a peculiarity of the causative microbe; (6) cannot be ascribed to climatological influences; (7) cannot be traced to the race, mode of life, or diet of the patients; (8) is not due to faulty "technique"; (9) does not constitute an exception to the rule.

10. The value of Widal's test is lowered by the fact that prophylactic inoculation against typhoid produces agglutinins which persist for long periods and may be increased by a non-typhoid infection.
11. There are no simple substitutes for Widal's test.
12. Specific C.F.T. can be made a very satisfactory diagnostic method for typhoid.
13. It has repeatedly been observed that a C.F.T. in typhoid fever gave a positive result at a period when the Widal was still negative.
14. Prophylactically inoculated people do not, as a rule, possess specific amboceptors—at least not for long after the last inoculation—and for such persons a specific C.F.T. would appear to be much more satisfactory than the Widal.
15. Widal's reaction ought to be replaced by specific complement fixation tests.

H. M. Hanschell.

LUNG (Y. Y.) & FOSTER (J. H.). **Typhoid and Para-Typhoid Fever in Changsha.** —*Nat. Med. Jl. China.* 1923. Sept. Vol. 9. No. 3. pp. 185-197. With 2 charts in text. [2 refs.]

NATIVE DIETARIES.

JOLLY (G. G.). **The Use of Germinated Pulse and Beans in the Natural Dietary of the Burmese.**—*Indian Med. Gaz.* 1923. June. Vol. 58. No. 6. pp. 255–257.

The importance of germinated pulse as a supply of vitamins B and C is brought to the notice of tropical workers. This product is on sale in the bazaars in many parts of India and Burma and is regarded as a highly palatable food. Various species of pulses and beans, with their respective vitamin values, are described.

The pulse or bean is first washed and then immersed in water for 12-24 hours. The resulting product is placed in baskets or porous pots or spread upon a moist mat or sprinkled upon a layer of soil or sand. "A shoot appears on the second day and germination is allowed to continue for two or three days, according to the kind of pulse used and the size of shoot desired."

The author states, "the question of the inclusion of germinated pulse in the dietary of sailors and soldiers, police and other bodies of public servants in receipt of rations, and in institutions, such as hospitals, jails, schools and asylums is, in my opinion, one of considerable importance."

A. D. Bigland.

WILLE (W. A.). **Xerophthalmia. A Deficiency Disease (Avitaminosis).**—*Trans. 4th Congress of the Far Eastern Assoc. of Trop. Med.* 1921. Vol. 1. pp. 245–257. With 4 plates.

The following points, interesting from a tropical dietetic point of view, are worthy of note.

Xerophthalmia may occur in institutions the dietary arrangements of which are apparently excellent. The reason for this is that in the Dutch East Indies coco-nut oil is the chief fatty substance employed and this does not contain the fat-soluble A vitamin.

Not only cod-liver oil but also ox-liver is of great service in protecting the community against xerophthalmia. The author advises that 100 grams of ox-liver three times a week in place of meat should be given to each person in those institutions where the disease is likely to occur.

A. D. B.

OSBORNE (Thomas B.) & MENDEL (Lafayette B.), with the Co-operation of CANNON (Helen C.). **Eggs as a Source of Vitamin B.**—*Jl. Amer. Med. Assoc.* 1923. Feb. 3. Vol. 80. No. 5. pp. 302–303.

By extracting egg yolk with water it was found that a product comparatively rich in vitamin B was obtained. Eggs are not exceptionally rich in this vitamin; the average sized hen's egg is equivalent in vitamin B potency to about 150 cc. (5 oz.) of cow's milk.

A. D. B.

i. CRAMER (W.). **On the Mode of Action of Vitamins.**—*Lancet.* 1923. May 26. pp. 1046-1050. With 6 text figs. [9 refs.]
ii. ——. **On Vitamin Underfeeding.**—*Brit. Jl. Experim. Path.* 1922. Vol. 3. No. 6. pp. 298-306. With 1 fig.

i. The author, while agreeing that every highly organized animal requires vitamins and without them death will occur, does not accept the common view that every cell in the body has these requirements. He advances the following arguments in support of his contention: 1. In vitamin starvation the adrenal gland hypertrophies, which would appear to indicate that for these cells, at any rate, vitamins are not necessary. 2. DREW has shown that mammalian cells can be grown in a saline medium for an indefinite time in the presence of a watery extract of the embryo. This extract is not particularly rich in vitamins and similar cell growth cannot be obtained with yeast extract. 3. Yeast cells can synthetize vitamin B and plant cells can do the same for vitamin A. 4. The curative effect of light in rickets suggests that certain cells can synthetize vitamin A under this influence and pass it on to the rest of the body. 5. In avitaminosis definite lesions occur in certain tissues; thus there is atrophy of lymphoid tissues with resulting marasmus in vitamin B deficiency, while in vitamin A starvation there is thrombopenia and increased susceptibility to infection.

ii. The author does not agree that the action of vitamins is a purely negative one; he produces evidence to show that vitamins do exert a positive action, namely a stimulation of the digestive and assimilative processes and he regards them, therefore, as "food hormones."

A. D. B.

COWARD (Katharine H.) & CLARK (A. J.). **The Vitamin Content of Certain Proprietary Preparations.**—*Brit. Med. Jl.* 1923. Jan. 6. pp. 13–15. With 1 chart in text.

These authors have done very important work upon the vitamin content of certain proprietary preparations now on the market, viz., metagen, maltoline, roboleine, virol, vitmar and Mellin's food. Great claims are made for the vitamin efficiency of these products and the following results will be of wide interest:—

In none of the cases examined have the manufacturers succeeded in concentrating vitamins on the commercial scale. This result was only to be expected, for the concentration of the two more stable vitamins (A & B) is a process of the greatest difficulty even on a laboratory scale, and in the case of the successful attempts the final yield of purified vitamin only represents a minute fraction of the total quantity of vitamins present in the raw material." Also "under normal conditions of life an adequate supply of vitamins can be easily ensured by including in the diet a suitable amount of protective foods, such as milk, butter, green vegetables and fruit and no advantage is to be gained by trying to obtain these substances in the form of drugs."

A. D. B.

LOPEZ-LOMBA (J.). **Modifications pondérales des organes chez le Pigeon au cours de l'avitaminose B.**—*C.R. Acad. Sci.* Paris. 1923. May 14. Vol. 176. No. 20. pp. 1417–1419. With 1 fig.

By observing a series of pigeons fed upon a vitamin-free diet and killing one of the birds each day the authors have shown that avitaminosis can be divided into four stages.

1. A period of incubation which lasts about nine days in which practically no signs are present except that certain organs begin to show slight alterations in weight.

2. *Ninth to fourteenth day* (about); thyroid, heart, spleen, and thymus hypertrophy, adrenals and pancreas atrophy. The animals pass through a toxic stage and some may die.

3. *Fourteenth to twenty-third day* (about); the thyroid returns to normal, while the adrenal begins to hypertrophy; spleen, liver, thymus and pancreas atrophy and the testicle becomes markedly hypertrophied.

4. *From the twenty-third day onwards* the adrenal gland rapidly hypertrophies, the pancreas continues to lose weight, the thyroid and heart atrophy, symptoms of paralysis begin.

A. D. B.

MOURIQUAND (G.), ROCHAIX (A.) & MICHEL (Paul). **Carence et infections expérimentales aiguës du cobaye.**—*C.R. Soc. Biol.* 1923. June 23. Vol. 89. No. 22. pp. 247–249. [4 refs.]

These authors conducted experiments to ascertain the effects of infection on starved animals. Forty guinea-pigs were fed on a diet of barley and hay. By the twenty-first day all presented typical signs of scurvy. The animals were then divided into four groups of ten each; one group was allowed to continue upon the deficient diet, the other three groups were inoculated with anthrax, diphtheria and *B. pyocyancus* respectively. Normally-fed guinea-pigs were used as controls. It was found that diphtheria infection was not influenced by scorbutic starvation whereas in the cases of anthrax and *B. pyocyaneous* the signs of infection were more serious and more extensive in the controls than they were in the scorbutic animals.

A. D. B.

ABEL (E.). **Remarques à propos de quelques expériences d'avitaminose.**—*C.R. Soc. Biol.* 1922. Dec. 9. Vol. 87. No. 37. pp. 1213–1215.

That previous dietary conditions play some part with regard to the vitamin needs of the body is shown.

Young birds just hatched from the egg are less resistant to vitamin starvation than are older birds who have lived upon a normal diet for a time.

A. D. B.

COLLAZO (J. A.). **Vergleichende Untersuchungen ueber die Assimilationsfähigkeit der Zellen bei der Avitaminose und nach dem Hungerzustande.** [Capacity for Assimilation of Cells in Avitaminosis and Starvation. Comparative Studies.]—*Deut. Med. Woch.* 1923. Jan. 26. Vol. 49. No. 4. pp. 110–111. With 5 text figs. [9 refs.]

This author points out the importance of dietary conditions previous to the inception of avitaminotic experiments. The starving body, having nothing to assimilate, apparently keeps its store of vitamins intact. If then such a starved body be fed upon a diet containing no vitamins at all it will gain weight for a time, that is until the supply of vitamins already in the body is exhausted.

If the meat and offal of starved animals be added to the diet of an animal suffering from avitaminosis it will be found that the animal's weight either remains stationary or increases, whereas if the meat and offal of avitaminosed animals be added the loss of weight continues as before.

A. D. B.

McCarrison (Robert). **Pathogenesis of Deficiency Disease. No. XI. Observations on Fat-Excess in Relation to Iodine Requirements and to the Thyroid Gland.**—*Indian Jl. Med. Res.* 1923. July. Vol. 11. No. 1. pp. 1-51. With 45 figs. [3 refs.]

This paper deals with observations on fat excess in relation to iodine requirements and to the thyroid gland. The author made use of tadpoles and pigeons for this purpose. The experiments with the former are perhaps not of sufficient general interest to warrant their discussion. In the case of the pigeons it was found that these birds confined in cages which had become grossly contaminated by excreta were very liable to thyroid enlargement. That this was not due to lack of exercise but to contamination of the bird's food and drink was shown by the fact that it could be prevented by scrupulous cleanliness and to a certain extent by the administration of chlorine water. It was also shown that this thyroid enlargement was not connected with inadequate supply of iodine in the food but rather to inadequate utilization of that substance consequent upon the gastro-intestinal infection resulting from the dirty cages. Experiments are described showing that excess of butter or oleic acid in the food may increase the goitre-producing action of the insanitary conditions and that this also is related in some way to bacterial changes in the digestive tract. It is most interesting to note that cod liver oil gives complete protection against thyroid enlargement due to this cause.

A. D. B.

Juniper (A. B). **[Native Dietary on Niue Island (Cook Islands).]**—*Jl Home Econ.* 1922. Vol. 14. No. 12 pp. 612-614. [Summarized in *Experim. Station Rec.* 1923. June 26. Vol. 48. No. 9. p. 859]

MISCELLANEOUS.

HAMERTON (A. E.). **The Establishment of an Antirabic Institute in the Tropics.**—*Proc. Roy. Soc. Med.* (Sect. Trop. Dis. & Parasit.) 1923. Aug. Vol. 16. No. 10. pp. 49–55. [4 refs.]

The author describes in detail the manufacture of SEMPLE's carbolized antirabic vaccine, as being a safe and efficient preparation which any competent bacteriologist can make and use with the furniture of his laboratory. Glycerinated virus is admirable for temperate latitudes, but in the tropics—or, at least, in the author's Mesopotamian experience —there is difficulty about sterile glycerine in a dusty town, and contact with glycerine kills the virus rapidly and so might impair the potency of the vaccine. During the last six months of 1921, 137 patients were treated at the Bagdad Central Laboratory by carbolized vaccine and no case of hydrophobia occurred, nor were there any unpleasant after-effects.

Other items of the author's Mesopotamian experience of rabies were noticed in this *Bulletin,* Vol. 20, p. 602.

A. Alcock.

HORNUS (P.). **Rapport sur le fonctionnement de l'Institut Antirabique, de l'Institut Vaccinogène et du Laboratoire de Bactériologie de Rabat pendant l'année 1922.**—*Arch. Inst. Pasteur de Tunis.* 1923. July. Vol. 12. No. 2. pp. 259–266.

The number of persons treated during 1922 was 521 ; the injuries had been inflicted in 473 cases by dog, in 17 by cat, in 2 by cow, in 1 by a horse, in 1 by a ferret, and in 27 cases by man ; in 25 cases the rabidity of the assailant was confirmed by experiment, and in 156 cases by clinical diagnosis ; in the remaining 340 cases rabies was merely suspected ; in 7 of the cases of confirmed rabidity the animal (dog) had been running loose. Of the 521 treatments only one was unsuccessful. The method of treatment was by cords of 4, 3, 2, 1 days' desiccation, 3 6 cc. of emulsion being injected once or twice a day according to the severity of the bite : the term of treatment, which was well borne, varied from 10 to 25 days.

A. A.

ARCHIVES DES INSTITUTS PASTEUR DE L'AFRIQUE DU NORD. 1923. Feb. Vol. 3. No. 1. pp. 99–117.—**Fonctionnement des services de l'Institut Pasteur de Tunis pendant l'année 1922.**

In his account of the antirabic service the writer, as before, strongly condemns the laxness of the natives and authorities of Tunis in the administration of the laws for the control of rabies (this *Bulletin,* Vol. 20, p. 33). In this year, moreover, nine persons or groups of persons were treated who had been contaminated by men attacked with rabies and untreated. The usual statistics and tables of analyses are given.

A. G. B.

TÉODORASCO (C.). **Renforcement avec raccourcissment de l'immunisation antirabique par injections sous-cutanées et intraveineuses combinées.**—*C. R. Soc. Biol.* 1923. May 12. Vol. 88. No. 16. pp. 1235–1236.

After discussing from an experimental basis the reasons why antirabic treatment, by whatsoever method, is inefficacious for certain badly bitten patients, the author, writing from the Hygiene Laboratory of Chisinău (Bessarabia), describes a procedure by which patients to the number of 45, very badly bitten about the head, and in nine instances by a wolf, have been treated without the intercurrence of any accident and with success confirmed by time. The procedure, of which the technique is to be hereafter described, consists in intravenous injections for seven days and subcutaneous injections for 13 days being carried on concurrently.

A. A.

HARVEY (W. F.) & ACTON (H. W.). **An Examination into the Degree of Efficacy of Anti-Rabic Treatment.**—*Indian Jl. Med. Res.* 1923. Apr. Vol. 10. No. 4. pp. 1020–1077. [41 refs.]

The authors mark the contradictory statements made regarding the results of particular modifications of experimental antirabic treatment, and they ascribe them to errors in technique, difficulties of exact diagnosis, the use sometimes of fixed virus in other cases street virus, the use of different animals and of different methods of inoculation, and to the differing aims and purposes of the experiment; all these things are fully and fairly discussed. Their own experiments appear to them to justify the following opinions: that between street virus and fixed virus there is no such essential difference—though differentiation due to mode and upkeep of fixed virus is allowed—as seems to be postulated by the theory of antirabic inoculation; that living fixed virus, although very rarely infective, may not be wholly innocuous to man; that the foreign nerve material necessarily inoculated with virus is possibly the cause of the neuro-paralytic accident and, therefore, that in the process of dead virus immunization an inoculation may be non-infective without necessarily being innocuous; that normal brain substance seems to render the recipient more sensitive to infection by rabies virus than no treatment at all; and that antirabic serum will neutralize—whether specifically or not being left an open question—rabies virus in vitro whether it be produced from an animal intensively treated with fixed virus or with normal brain. Assuming sub-dural inoculation to be too severe a test of immunity the authors experimented with an intramuscular test, and their experiments showed for fixed virus immunization a distinct advantage over no treatment and an advantage over street virus, and a disadvantage in normal brain immunization compared with no immunization at all. Experiment also showed that dead fixed virus gives protective results as good as or better than immunization either by dried cord (Pasteur) or by diluted fixed virus (Hoegyes).

The authors emphasize the outstanding fact that some protection from infection is afforded by the use of rabies virus in subcutaneous inoculations. Both their statistical observations in man and their experiments show that carbolized vaccine gives as good results as either dried cord treatment. Their statistical investigations further show that legislation is highly effective in reducing mortality from rabies, and they think that a thorough campaign against the animals that transmit the infection is the way to eradicate infection.

A. A.

REMLINGER (P.). **Les microbes des moëlles rabiques.**—*Arch. Instituts Pasteur de l'Afrique du Nord.* 1923. May. Vol. 3. No. 2. pp. 119–123. [4 refs.]

The author has studied the nature and origin of the microbes responsible for the accidents—inflammation, induration, abscess—that often occur at the site of inoculation in antirabic treatment. He gives here an account of his work, from which he appears to conclude—for his argument is not very clearly expressed—that the source of these microbes (which include staphylococcus of several kinds, streptococcus, bacillus coli, proteus, etc.), is not carelessness in removal of cords and preparation of emulsions, but the cords themselves, particularly cords taken from dying or dead animals. Rabbits used for passage of virus should be fed so as to avoid diarrhoea, and the animals should not be too young. They should die in the cold chamber, or should be killed—in summer at any rate—24, or even 48, hours before the anticipated moment of death. Cords that appear at all soft when extracted should not be used in antirabic treatment.

A. A.

REMLINGER (P.), LEGER (Marcel) & TEPPAZ. **Contribution à l'étude de la Rage au Sénégal.**—*Bull. Soc. Path. Exot.* 1923. Jan. 10. Vol. 16. No. 1. pp. 4–6.

Record of experiments proving (*a*) that the fixed virus of the Pasteur Institute of Paris has exactly the same fatal effect on laboratory animals (rabbits and guinea-pigs) in Dakar (Senegal) as it has in Tangier (Morocco) and in Paris; (*b*) that street virus of Morocco has the same fatal effect on laboratory animals in Senegal as it has in Morocco; and (*c*) that street virus of Senegal has the same uniformly fatal effect on laboratory animals in Morocco as street virus of Paris. If, therefore, in Senegal there be, as some think and as HECKENROTH's recently-published experiments appear to suggest, two kinds of street virus—of which one is of extraneous and imported origin, while the other is of indigenous origin and not capable of transmission to man by dog-bite—the present authors have not yet encountered the latter although they intend to continue their search for it.

A. A.

ROBERT (Léopold). **Accidents paralytiques et hyperesthésie cutanée (rage atténuée) au cours du traitement antirabique. Guérison.**—*Bull. Soc. Path. Exot.* 1923. June 13. Vol. 16. No. 6. pp. 417–422. [5 refs.]

In declared rabies in man the whole nervous system is involved, so that contrary to accepted opinion, sensory are as constant as psychic and bulbar disturbances. The author has already drawn attention to itching as one of the most constant premonitory and persistent symptoms of confirmed rabies and has since verified the constancy of this symptom in 14 cases. On the other hand, in the course of antirabic treatment though paralytic accidents may occur they have never, in the author's experience, been associated with sensory troubles.

The author therefore reports at considerable length a case under antirabic treatment where paralysis (of the bladder, rectum, and legs) was concurrent with intolerable itching, and he offers an explanation of the phenomenon in harmony with his views: it is the first case of serious paralysis observed by him in the course of nearly ten years experience embracing more than 1,300 treatments under uniform therapeutic conditions.

The patient, an American clergyman of 42 years, was, on January 7 bitten in the left leg, and he thought no more of it until, more than a week afterwards, he received a summons to appear for treatment as the dog had gone mad and bitten other people. In a state of intense excitement he appeared for treatment, which was begun on the 13th day after he was bitten (January 20). After the sixth injection he complained of headache, fever, and stiffness, and the site of the injections was marked by a large patch of erythema. Treatment was continued to the twelfth injection, although the symptoms persisted. The day after the twelfth injection (February 1) he was in a state of fever and intense excitement; backache and pains in other parts made movement a penance; the bladder and rectum were paralysed and the legs rigid; the arms were continuously tremulous, and there was an exquisitely acute burning sensation spreading over belly and chest from the site of the inoculations. This state persisted until February 6, when the burning sensation became an intolerable itching. By February 9 the fever had gone and the other symptoms were slightly ameliorated, except the itching, which had spread symmetrically to the arms and the back. On February 10 all the symptoms were in course of disappearance and the nervous excitement was subsiding. On February 16 the patient went home, weak and depressed, but otherwise fairly well. The latest news, more than five months after the biting, is that he is in excellent health.

The patient had no history of hysteria or alcoholism, or of anything but malaria and an emotional disposition, that is to say of a peculiar susceptibility of the whole nervous system. The case emphatically is not one of mild rabies of canine origin: the incubation was too short and there was no hyperaesthesia at the site of the bite. The succession of symptoms—first erythema at the site of inoculation, then a burning sensation, and then itching spreading from the same site—and the concurrent evolution of these with motor and sensory inhibitions giving rise to paralyses, prove it to be a case of attenuated rabies due to antirabic inoculation, the alien nerve substance of the inoculations accounting for the paralyses, in a particularly susceptible person.

In a disease, like rabies, so full of obscurities, observations should, in the author's opinion, be multiplied and recorded.

A. A.

LEGER (André). **Modifications hématologiques et image d'Arneth dans la rage humaine et chez les individus soumis au traitement antirabique.**—*C. R. Soc. Biol.* 1923. May 12. Vol. 88. No. 16. pp. 1194-1196. [4 refs.]

The author makes some comparison of the blood of six patients suffering from confirmed rabies and 25 patients acquiring immunity under antirabic treatment: in the former the Arneth index was deviated to the right, in the latter to the left. His rabid patients were Annamites who were not treated, and died: in their blood the mean percentage of neutrophile polynuclears was 80, and in every one of the six cases the number of nuclear lobules in 100 neutrophile polynuclears was more than 400. His patients under treatment went through a course of 20 inoculations from cords of progressive virulence, and in each case the blood was examined once before treatment, again on the tenth day of treatment, and a third time after the last inoculation: in these cases the percentage of neutrophile polynuclears was diminished (nor was there any "labrocytosis" ? turbulence of their nuclei) on the tenth day but was tending to normal at the final examination. In two cases, up to the present, an observation of the blood has been made some time after treatment: in one of these there was still, at the end of seven months, an Arneth deviation to the left; in the other, at the end of a year, the Arneth index was normal.

A. A.

DUMITRESCO-MANTE. **Phénomènes rabiques mortels survenus trois ans après la morsure chez un vacciné.**—*Bull. et Mém. Soc. Méd. Hôpit. de Paris.* 1923. Apr. 19. Year 39. 3rd Ser. Vol. 47. No. 12. pp. 542–545. [8 refs.]

After recounting a number of cases where the incubation period of rabies was reported to be prolonged in an extraordinary degree and the individual writers who severally authenticated them, the author gives his own experience of a case where rabies supervened three years after infliction of a rabid-dog-bite which had been immediately treated by anti-rabic vaccination.

On April 4, 1918, the sufferer in this case, a porter, 38 years of age, was bitten, not extensively but rather deeply, on the dorsum of the right hand, by a dog known by Dr. BOPP of the Babes Antirabic Institute at Bucharest to be rabid. He was brought to the said Institute and underwent the anti-rabic treatment there in vogue, receiving during 17 days four series of two daily injections of 5 cc. of vaccine. After treatment he was not heard of again until the April 16, 1921, when he went to the Brancovan hospital at Bucharest with obvious and typical symptoms of rabies. He was lucid enough then to declare that he had not been bitten by any suspect animal since his accident in 1918, and this assertion was confirmed by his friends. The next day, after a phase of extraordinary excitement, he died in coma and paralysis. Neither Negri bodies nor Babes nodules could be detected post mortem.

A. A.

COLLIN (L.). **Sur les maladies vénériennes dans la garnison de Tananarive.**—*Bull. Soc. Path. Exot.* 1923. July 11. Vol. 16. No. 7. pp. 534–539.

The prevalence of venereal disease in Madagascar is astounding, not only among the troops but even more among the native population. The indifference of the natives to syphilis is amazing; in the 11 years 1909-1920, a third of the population appears to have come under observation for syphilitic affections, and in 1920 no less than 43-49 per cent. of the native mortality was attributed to syphilis more or less complicated with malaria. The explanation is to be found in the peculiar institutions of the country, where prostitution is disgraceful, but cohabitation—which if not mutually satisfactory may be discontinued without impropriety—is the recognized preliminary to betrothal. As there are no professional improper females, prostitution for the troops is clandestine, and prophylaxis therefore depends upon

" educative " measures and " personal hygiene," though no one dares to risk his reputation by giving official countenance to personal hygiene. The formula for a useful prophylactic ointment is given.

A. A.

KING (M. R.). **Incidence of Venereal Diseases among American Seamen in the Orient.**—*Public Health Rep.* 1923. June 29. Vol. 38. No. 26. pp. 1477-1480. With 1 chart. [1 ref.]

It is shown by table and by graph that two-thirds of the American seamen treated as out-patients or in hospital at Manila are suffering from venereal disease. Allowance being made for the early stage of many of the cases, chancroid is unusually prevalent; instead of the usual 2·6 per cent. of chancroid and 51·1 of syphilis, we have 12.3 per cent. syphilis and 30·3 chancroid. The author attributes the extent of venereal disease at Manila to unrestricted prostitution at other ports of the Orient and the predominance of chancroid to the personal filthiness which prevails at those ports.

A. G. B.

LENNOX (William G.). **Neurosyphilis among the Chinese with Findings in Sixty-Five Cases.**—*China Med. Jl.* 1923. Aug. Vol. 37. No. 8. pp. 663–671. [19 refs.]

To secure statistical information on the prevalence of syphilis among the Chinese the author obtained reports from 15 hospitals and, for comparison, from 9 hospitals in America. The figures for in-patients showed syphilis to be more than three times as frequent among the Chinese, and for out-patients about twice as frequent. Wassermann tests on Chinese in-patients show 24 per cent. positives in one series and 39 in another; the corresponding figure for Americans is 10 to 30. On the other hand neurosyphilis is comparatively rare among the Chinese and the same hospital statistics show that affection of the central nervous system is seven or eight times more frequent in America. There are at least five explanations of this apparent racial discrimination, affecting the black as well as the yellow peoples :—

1. A specific strain of parasite among coloured races which spares the central nervous system.
2. The nervous system of the coloured races is less susceptible to syphilitic infection than the white.
3. Syphilis is a lately acquired affection and has not yet reached the attenuated form in which damage to the nervous system is common (not valid for the Chinese who have had syphilis with them for hundreds of years).
4. The coloured races have not been subject to modern antisyphilitic treatment which leaves the spironema no lurking place but the central nervous system.
5. The low incidence may be more apparent than real. Such diagnoses in America are based on examination of the spinal fluid as well as symptoms, in China on signs and symptoms alone. That this factor must be considered is shown by the statement that the incidence of neurosyphilis among syphilitic patients at the Peking Union Medical College is about six times as high as reported by the fourteen other Chinese hospitals; here there is a special syphilis clinic. This, however, will not account for all the observed racial differences.

Table 3.—Incidence of Various Forms of Neurosyphilis among Hospital In-patients in China and America.

General Hospitals.	Number and Percentage of Cases.			
	General Paresis.	Tabes Dorsalis.	Cerebro-spinal	Lesions of Vascular Origin.
China	5 (3%)	51 (34%)	55 (37%)	39 (26%)
America ..	481 (48%)	299 (39%)	223 (22%)	—

Of the 26 per cent. with "lesions of vascular origin," 6 out of 7 present a paraplegia due to transverse myelitis of the cord.

The principal findings in 65 cases of neurosyphilis seen at Peking are recorded.

A. G. B.

MENGERT-PRESSER (Hilde). **A Case of General Paralysis with a Chinaman.**—*Meded. Burgerlijk. Geneesk. Dienst in Nederl.-Indië.* 1923. Pt. 2. pp. 189-191. [4 refs.]

The patient in this case was a man of 36 and lately an opium consumer. His signs, symptoms, and serological reactions are described; the delusions, allowing for Oriental colouring, were quite characteristic His condition is inferred to have existed for about six months before he was admitted, and he died about six weeks afterwards. Post-mortem the cerebral convolutions were atrophic, the pia mater being thickened and in places adherent; sections showed spirochaetes—"exactly similar to *Spirochaeta pallida* Schaudinn"—scattered among the atrophic ganglion cells, not grouped around vessels. The clinical diagnosis was further confirmed by the observation of perivascular infiltrates showing the ammonium potassium sulphide ferrocyanide reaction.

A. A.

MCDANIEL (F. L.). **The Incidence of Neurosyphilis in Treated Cases on the Island of St. Croix, Virgin Islands of the United States.**—*U.S. Nav. Med. Bull.* 1923. Sept. Vol. 19. No. 3. pp. 343-345. [3 refs.]

Treatment for syphilis has been compulsory in St. Croix since 1906 and complete case histories are available from 1918. The patients receive three intravenous injections of arsphenamine (0·3, 0·6, 0·6 gm.) and 12 intramuscular injections of salicylate of mercury given at weekly intervals (0·5, 1, 1·5, 2, 2 . . . . 2 grains). A blood Wassermann is then done and, if negative, repeated after three months. If positive, a second course of treatment is given and so on. No patient is discharged as cured till he is free from evidence of the disease and four successive blood Wassermanns have been negative.

The author induced 100 patients to return for re-examination [after what intervals is not stated]. All had been treated at the secondary stage. All were negroes, 52 men and 48 women, average age 45. A neurological examination was made and a spinal fluid Wassermann. The spinal fluids of 16 (8 men and 8 women) gave a positive reaction; 12 of these had definite clinical symptoms of neurosyphilis. Of the 16, 9 had received one course, 5 two, 1 three and 1 four. These results are interesting because many authorities state that the negro race is peculiarly immune to syphilitic attacks upon the nervous system.

A. G. B.

THIROUX (A.). **Le tabès chez les indigènes dans les colonies françaises.** —*Bull. Soc. Path. Exot.* 1923. July. 11. Vol. 16. No. 7. pp. 475–476. [4 refs.]

The author protests against the preconception that the black races are by nature exempt from tabes. In the venereal dispensaries at Tananarive in Madagascar six cases were observed in 1921–1922.

A. A.

LE DENTU (R.). **Les sels d'arsenic en injection intraveineuse chez les indigènes. Guérison rapide dans un cas d'hémiplégie syphilitique.**—*Bull. Soc. Path. Exot.* 1923. June 13. Vol. 16. No. 6. pp. 430–433.

Case of a Malagasy aged 26, who had had a stroke in the night; there was complete right hemiplegia, left facial paralysis and paresis of the tongue. He received at once novarsenobenzol, 0·3 gm. intravenously, and after some improvement 0·45 gm. on the fifth day. After two weeks he was sitting up, and a week later walking about. He received further doses of 0·6 and 0·9 gm., in all 2·25 gm. in a month. MILIAN is quoted on the necessity of prompt treatment in such cases to re-establish the lumen of the vessel and ward off endarteritis obliterans and mortification of tissue. The author has been giving intravenous injections of arsenobenzol and 914 for 15 years with no accidents and uniformly good results and is not disposed to abandon arsenic in favour of bismuth.

A. G. B.

SCHAEFFER (H.). **Méningite syphilitique tertiaire avec accidents fébriles à type pseudo-palustre.**—*Presse Méd.* 1923. Sept. 8. Vol. 31. No. 72. pp. 772–773. With 1 fig. [2 refs.]

The patient in this case, a man of 29 years, displayed all the symptoms and signs of meningitis. On the 19th, 21st and 23rd days of his illness he had what resembled typical ague-fits—shivers succeeded by fever and profuse sweating, and a rise of temperature to about 104° F.—but the microscopic examination of his blood revealed nothing abnormal. On the 26th day of his illness the cerebro-spinal fluid, which heretofore had been negative, gave a positive Bordet-Wassermann reaction. A course of intravenous injections of novarsenol then brought about rapid amelioration. The author remarks that although apyrexia is supposed to be the rule in tertiary syphilis, pyrexia occurs often enough to perplex diagnosis.

A. A.

FRAISSINET & MARTIN. **Syphilis pulmonaire simulant la tuberculose cavitaire chez un Malgache.**—*Bull. Soc. Path. Exot.* 1923. June 13. Vol. 16. No. 6. pp. 396–398.

The patient, a Malagasy soldier of weight 52 kilos, had all the signs of advanced pulmonary tuberculosis, with pleurisy and signs of cavitation of the right lung. He had also general slight enlargement of glands and hyperkeratosic syphilides on hands and feet. The case was one of syphilis plus tuberculosis or syphilis alone. Between January 27 and February 26 he received intravenous injections of novarsenobenzol and cyanide of mercury, intramuscular injections of biniodide of mercury, and iodide of potassium by mouth. The Wassermann reaction on February 1 was strongly positive. Tubercle bacilli could never be found in the sputa, and a guineapig inoculated on February 10 did not develop tuberculous lesions. The specific treatment led to a " veritable resurrection " of the patient, who left the hospital on May 15 weighing 66 kilos and with lung signs nearly cleared up.

A. G. B.

SARKAR (Sarasi Lal). **Lethality of Cinchona Derivatives on** *Bacillus typhosus* **and a Variety of Flagellate.**—*Calcutta Med. Jl.* 1923. Apr. Vol. 17. No. 10. pp. 162–164.

In experiments with an undetermined flagellate the observed minimum dilutions for preventing growth were as follows: optochin, 1 in 1,600; hydroquinine hydrochlor., 1 in 1,200; cinchona sulphate, 1 in 1,200; quinine hydrochlor., 1 in 800; quinine sulphate, 1 in 800; cinchonidine sulphate, 1 in 600.

In experiments with *Bacillus typhosus* 5 drops of a 24-hours broth culture of the bacillus was mixed with 5 cc. of a solution (in definite strength) of the given drug, after several intervals of 2½, 5, and 7½ minutes the several mixtures were inoculated into sterile broths, and at the end of 24 hours the individual results were investigated by the Rideal-Walker test. The results of the R.-W. test are tabulated as follows: optochin "·4"; hydroquinine hydrochlor., 1; cinchona sulphate, 0·5; quinine hydrochlor., 0·5; quinine sulphate, 0·5; cinchonidine sulphate, 0·3.

A. A.

AKASHI (M.). **Ueber die Chininspeicherung der roten Blutkörperchen in vitro.** [Quinine Storage in the Red Corpuscles in vitro.]—*Arch. f. Schiffs- u. Trop.-Hyg.* 1923. Feb. Vol. 27. No. 1. pp. 12–30. [13 refs.]

The author gives an account of the researches of MORGENROTH [see this *Bulletin*, Vol. 13, p. 81], GIEMSA & HALBERKANN, SCHNABEL, RONA & BLOCH [all German authors] on this subject. From his own experiments for the details of which the paper must be seen, he draws the following conclusions :—

1. The storage of quinine by the red cells *in vitro* can be shown by analytical quantitative methods with the use of blood from horses, rabbits, and cattle. (2) The amount of quinine stored varies with the concentration of the alkaloid, the number of blood cells and the temperature. (3) The quinine taken up by the cells at the highest possible concentration is given off later to the surrounding fluid owing to alterations in the cell membrane, with the production of haemolysis. (4) In the presence of much carbonic acid the red cells do not store up quinine. (5) The liver cells behave in vitro like the red cells. (6) Quinine accumulates in the kidneys and lungs.

(7) Experiments with the living animal do not show corresponding results, so that it must remain uncertain whether quinine is stored up by the erythrocytes and organ cells *in vivo*.

A. G. B.

BOECKER (Eduard). **Ueber die Verteilung der Chinaalkaloide im Säugetierorganismus.** [The Distribution of the Cinchona Alkaloids in the Animal Organism.]—Reprinted from *Biochem. Ztschr.* 1922. Vol. 130. No. 1–3. pp. 312–320. [6 refs.]

The author proposed to himself the question: does the proportion of cinchona-alkaloid that the individual organ takes from the lymph-stream stand in simple relation to the relative weight of the organ; or does it depend upon the specific qualities of the organ irrespective of weight? He therefore subcutaneously administered quinine hydrochloride, in varied individual doses, to six guineapigs and then killed the different animals at varied intervals of time; and, selecting the lungs and the liver for comparison, he found that in every case and circumstance the proportion of alkaloid absorbed by the relatively lighter lungs was greater—in five instances from 7·6 to 9·6 times greater—than that absorbed by the relatively heavier liver. He also administered quinine-hydrochloride to one guineapig and optochin-hydrochloride to another *per os*, and here again found that the proportion absorbed by the lungs was greater—in the one case about 4·3 times, in the other case about 10·5 times greater—than that absorbed by the liver. The details of the experiments are described and tabulated.

A. A.

BOECKER (Eduard). **Ueber die Resorption des Chinins nach subcutaner und intramuskulärer Injektion.**—*Ztschr. f. Hyg. u. Infektionskr.* 1923. June 20. Vol. 100. No. 1. pp. 102–106. [8 refs.]

The author gives details of some experiments that in his opinion tend to refute the commonly accepted view that ordinary subcutaneous intramuscular injections of quinine solutions result in the establishment of local depôts of quinine, and that tend to support the contrary view that most of the alkaloid is absorbed quickly, the little that remains at the site of injection being gradually absorbed within no long limit of time. The following is a summary of the experiments:—

1. A guinea-pig of 700 gm. was killed 260 minutes after it had received a subcutaneous injection of 67 mgm. of quinine-hydrochloride in quinine-urethane solution: only 3·2 per cent. of the dose of quinine could be extracted from the tissues at the site of injection. (2) A guinea-pig of 500 gm. was killed 24 hours after it had received an intragluteal injection of 10 mgm. of quinine-hydrochloride dissolved in 0·5 ccm. of water: the tissues at the site of injection were oedematous but no quinine could be detected there. (3) A guinea-pig of 420 gm. was killed 290 minutes after it had received subcutaneously the same dose as guinea-pig No. 1: 9·2 per cent. of the quinine was extracted from the tissues at the site of injection. (4) A guinea-pig of 375 gm. was killed 280 minutes after it had received a subcutaneous dose of 33 mgm. of quinine-hydrochloride dissolved in 1 cc. of water: 5·8 per cent. of the quinine was recovered from the tissues at the site of injection. It should be mentioned that the subcutaneous injections were made in the abdominal region and that in searching for residue of quinine the whole abdominal integument was removed and triturated.

A. A.

SLARTSCHEFF (M.). **[Ueber Wirkung des Chinins auf die Gravidität und den Geburtsakt.]** [Action of Quinine in Pregnancy and Delivery.] Sonderdruck. Sofia (Bulgarien).—[Summarized in *Arch. f. Schiffs- u. Trop.-Hyg.* 1923. Feb. Vol. 27. No. 1. pp. 46-47.]

According to the summary this author, writing from Sofia, finds that quinine, in therapeutic doses, has no influence on the pregnant uterus and foetus and can be given to pregnant women without anxiety; that abortion and miscarriage occurring in pregnant women after the taking of quinine are caused not by the quinine but by the high temperature due to malaria; that quinine is the best prophylactic for the preservation of the pregnant state in malaria, and very seldom acts as an ecbolic. The case is cited of a multipara of 42 who took 100 gm. of quinine without interruption of a pregnancy in the fourth month.

A. G. B.

FLETCHER (William) & TRAVERS (E. A. O.). **Quinine Idiosyncrasy and Cinchonine.**—*Brit. Med. Jl.* 1923. Apr. 14. pp. 629-630.

A lady taken ill with benign tertian malaria on June 10 was treated from June 15 with bihydrochloride of quinine 30 gr. by intramuscular injection for three days and afterwards 45 grs. daily quinine sulphate by mixture together with nine minims of liquor arsenici hydrochloricus. On July 5 a blotchy rash appeared, chiefly on exposed parts, persisting till August 31. The whole of the skin was then affected, swollen, red, dry and peeling, face bloated, small vesicles and bullae about the mouth, throat inflamed. The appearance suggested exfoliative dermatitis due to arsenical poisoning. Quinine was being taken in solution and usually vomited. Now 16 gr. of cinchonine base (Howard and Son) daily was substituted in gelatine capsules. Vomiting ceased at once, parasites disappeared, rash and swelling subsided. On December 1, when the patient was last heard of, she was in good health.

The authors, who write from the Institute for Medical Research, Kuala Lumpur, though of great experience in malaria have met no other case of pronounced idiosyncrasy to quinine and even in this case they admit a doubt. ACTON claims that members of the laevo-rotatory group, including quinine, have different therapeutic properties from those of the dextrorotatory group which includes cinchonine. Hence the decision to employ this drug.

A. G. B.

GRANTHAM-HILL (C.). **Notes on a Case of Idiosyncrasy for Quinine.**—*Trans. Roy. Soc. Trop. Med. & Hyg.* 1922. Nov. 16 & Dec. 21 Vol. 16. Nos. 5 & 6. pp. 326-327.

A Syrian at Khartoum took ill with malaria on October 10 and received 5 gr. of euquinine. An hour later he was cyanosed with shallow respiration and pulse hardly countable; there was nausea, vomiting and diarrhoea and an urticarial rash. On recovery from these urgent symptoms he was treated with novarsenobillon and Fowler's solution but the fever was uninfluenced. Between October 17 and 25 intramuscular injections of quinine bihydrochloride were given night and morning, beginning with ½ gr. and working up to 6 gr. No intolerance was shown and the temperature came down; tinnitus was complained of. Afterwards 5 gr. of the salt was taken twice daily by mouth.

A. G. B.

BELL (Frances E.). **Hypersensitiveness to Quinine.** [Memoranda.]—*Brit. Med. Jl.* 1923. Sept. 15. p. 462.

In this case the patient, a woman, had taken a tonic dose containing 2½ grains of citrate of iron and quinine. Immediately she became giddy and faint. Within an hour painful symptoms of gastro-intestinal irritation occurred—vomiting and diarrhoea (which lasted for 24 hours). About the same time an intolerable itching began in the legs, and within a few hours the entire skin of the lower extremities from the waist to the feet turned deep red; this was followed in 24 hours by vesiculation in places, and in a few days by general desquamation. The skin of the upper extremities also suffered, but not to the same extent, nor in the same degree. The temperature ranged between 99° and 101°. It was afterwards elicited that the patient had suffered in the same way twice before from quinine in tonic doses—once 16 years ago, once 3 years ago.

A. A.

LE COMTE (A.). **Chinine-Aspirine.**—*Geneesk. Tijdschr. v. Nederl.-Indië.* 1923. Vol. 63. No. 3. pp. 465–467.

Le Comte gives a warning against the concurrent administration of quinine and aspirin (opening the possibility of quinotoxin intoxication), which may occur unintentionally in the tropics where many people are accustomed to take quinine on their own authority from time to time.

W. J. Bais.

RODENWALDT (Ernst). **Zur Frage der Chininresistenz. Antwort an Victor Schilling. Siehe dieses Arch. 1923. Bd. 27. Heft 4. S. 115.**—*Arch. f. Schiffs- u. Trop.-Hyg.* 1923. Nov. Vol. 27. No. 11 p. 404.

TROPICAL DISEASES BUREAU.

TROPICAL DISEASES BULLETIN.

Vol. 21.] 1924 [No. 2.

BERIBERI.

STANTON (A. T.). **The Control of Beri-Beri in the Far East.**—*Fifth Congress of the Far Eastern Assoc. of Trop. Med. Singapore. Sept. 1923.*—10 pp. 1923. Kuala Lumpur: F.M.S. Govt Printing Office.

After giving an historical survey the author describes an epidemic of beriberi, which occurred in a jail, caused by cooking parboiled rice under steam pressure; when the rice was cooked in the ordinary way cases ceased to occur. He points out that the greatest practical proof of the food deficiency theory in the Far East is the great reduction of late years in the number of cases of beriberi, due to increased general knowledge of the etiology and the greater use of undermilled rice.

For prevention it is essential that there shall be an abundant supply of undermilled rice at a price not above that of white rice. Taxation and higher customs duties on polished rice are impracticable. The establishment of local mills where undermilled rice can be produced is highly commended, but they may have to be subsidized.

Education and propaganda are important.

P. W. Bassett-Smith.

BOINET. **Beriberi.**—*Congrès de la Santé Publique et de la Prévoyance Sociale, Marseille,* 11–17 *Septembre, 1922. Comptes Rendus.* pp. 110–113.

During the war the author saw among the Indo-Chinese many cases of atrophic and paralytic beriberi similar to those observed among the Annamites in Tonkin. A case is described which, after two years of indefinite signs, was admitted to hospital and died from bronchopneumonia. At the Hospital of the Conception, Marseilles, M. AUBE reported 17 Japanese cases of beriberi which occurred there in 1917. The ship left Yokohama in July, called at Dakar in September, and all were then free from the disease. It stopped there six days and many contracted malaria. At Marseilles cases of dry beriberi occurred, and one died. No officers were affected. The onset of the disease, apparently latent infections following reduced vitality due to malaria, is interesting.

P. W. B-S.

BOINET & MÈGE. **Dix-neuf cas de beriberi nautique à bord d'un paquebot.**—*Congrès de la Santé Publique et de la Prévoyance Sociale, Marseille, 11–17 Septembre 1922. Comptes Rendus.* pp. 106 110.

Among 90 Chinamen carried on a M.M. mail steamer from China that had berthed at Marseilles on the 2nd February there occurred, in June-August following, an epidemic of beriberi. On the 24th June the first death was recorded, from acute wet beriberi; on the 23rd and 24th August there were two more fatal cases. Though the onset in these cases appeared to be sudden, enquiry showed that they had been suffering from symptoms previously and had been treated by acupuncture, etc., by other learned Chinese. An inspection brought to light 16 more cases with oedema and cardiac and other characteristic signs of beriberi. These were isolated, the necessary changes in diet were made, stimulants and theobromine were given, and after fifteen days all had improved and nine were considered to be cured. The food which had been given to the Chinese on board was found to be deficient in anti-neuritic factors. The Company then gave them European rations and no fresh cases occurred.

P. W. B-S.

LICHTENSTEIN (A.). **Rapport omtrent het voorkomen van beri-beri in de garnizoenen Batavia en Meester-Cornelis in de jaren 1919 tot en met 1922.** [The Occurrence of Beriberi in the Garrisons of Batavia and Meester Cornelis in 1919–22.]—*Geneesk. Tijdschr. v. Nederl.-Indië.* 1923. Vol. 63. No. 4. pp. 646 662. With 3 charts. [2 refs.]

The warning given by EIJKMAN, SCHÜFFNER, KUENEN (see this *Bulletin*, Vol. 19, p. 73), when the issue of unpolished rice in the Dutch Indian army was stopped in October 1918, is more than justified by the outbreaks of beriberi in the following years. At Batavia and Meester Cornelis the beriberi rate went up from 1·8 per 1000 in 1918 to 26 per 1000 in the first eight months of 1922 (*i.e.* 39 per 1000 per annum). Vitamin-containing additional foodstuffs are not appreciated by the native soldier and such food is not sufficient to cover the lack of B-vitamin if polished rice is used as the principal food. The re-introduction of rice containing about 0·40 per cent. P_2O_5 stopped the epidemic in question within 5 weeks.

W. J. Bais.

SUZUKI (T.). **Diagnostic radiologique du béribéri chez le nourrisson.**—*Le Nourrisson.* 1922. Mar. Vol. 10, No. 2. pp. 114–129. With 12 figs.

At autopsies of 9 infants dead from cardiac beriberi the author found that the heart was one and a half times larger than in other diseases, such as enteric, pneumonia, and tubercle, excepting only congenital heart disease. The liver and spleen are also greatly enlarged. When radiology was used in cases of infantile beriberi the same great increase in volume of the heart and liver was shown to be of considerable diagnostic and prognostic value, more particularly in acute cases. The examination showed also that in convalescence though the size greatly decreases, the heart still remains larger than in other diseases.

P. W. B-S.

MIURA (Sôichiro). **Ueber die Hirnerscheinungen im Verlauf der Säuglingsberiberi.** [The Brain Changes in Infantile Beriberi.]—*Monatsschr. f. Kinderheilk.* Leipzig. 1923. June. Vol. 26. No. 3. pp. 243–249. With 1 fig. [5 refs].

The author gives the ordinary symptoms of infantile beriberi and mentions the generally accepted belief that though the child may have all the typical symptoms, the mother shows neither subjective nor objective signs. He describes two cases, in Annamese, 6 and 8 months old, of 2 to 4 weeks' duration, dying cyanosed with heart failure. In each instance the mothers showed a slight degree of beriberi. Post mortem—sero-fibrinous meningitis, fatty infiltration and congestion of the liver, cloudy swelling of the kidneys, catarrhal pneumonia, and hypertrophy and dilatation of the heart were found. These pathological conditions are ascribed by the author to a toxic infection derived from the mother's milk.

P. W. B-S.

BOSE (S. R.). **A Note regarding Sporeforming Bacterium and Fungi growing on the Rice-Grains used by Families suffering from Beri-Beri and Epidemic Dropsy.**—*Calcutta Med. Jl.* 1923. Sept. Vol. 18. No. 3. pp. 389–393.

The investigation was carried out to determine if possible whether rice used by persons suffering from beriberi and epidemic dropsy contained infective organisms. The author found in the "diseased" rice, in apparently healthy grain, and in grain obtained from the common market in Calcutta a sporebearing organism allied to *B. subtilis*, which had a proteolytic action. It was killed by 1/1000 corrosive sublimate in under six hours. Probably this organism and moulds are merely external contaminators and their growth in culture media is due to the incomplete sterilization of the damaged rice grains, many of which are present in every sample. The author found no evidence that epidemic dropsy could be traced to changes produced in the rice grains, and the statement in the Editorial of the *Indian Medical Gazette* of Oct. 1922 that "The Problem of Epidemic Dropsy in Bengal is solved" cannot be accepted.

P. W. B-S.

NAGAYO (Mataro). **Beriberi and Rice Neuritis.**—*Jl. Amer. Med. Assoc.* 1923. Oct. 27. Vol. 81. No. 17. pp. 1435–1437.

A summary of the work done for the Beriberi Investigation Committee of the Department of War. It is chiefly a differentiation of rice disease of fowls and Chichiko (dyspepsia)* of infants from human beriberi which in Japan are considered to be distinct; though the author admits, that "it is quite probable that the eating of rice as the main diet may in itself contribute a factor to the occurrence of beriberi and administering vitamin B may produce good results in preventing and curing human beriberi."

P. W. B-S.

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* Develops after feeding with a substitute of milk prepared with rice.

KAWAKIYA (Shintarō), SUZUKI (Susumu) & KAGOSHIMA (Shigeru) [**Ueber die Reiskrankheit des Säugetieres.**] [Rice Disease of Mammals.]—*Ni. Byor. Gak. K.* Tokyo. 1921. Vol. 11. pp. 104–108. [Summarized in *Japan. Jl. Med. Sciences.* Tokyo. 1922. Vol. 1. No. 1. p. 3.]

The experiments were made on 64 puppies three to four months old. The diet was rich in carbohydrates but poor in vitamin B. The symptoms did not appear for about three months, but the illness was acute, with loss of appetite, cramps, pains and hyperglycaemia. The hearts were not hypertrophied, both sides being equal, but there was general atrophy with oedema, some hypertrophy of the suprarenals, and catarrhal changes in the digestive tract. The observations in general correspond with those seen in rice sickness of birds.

P. W. B-S.

OGATA (Tomosaburo), KAWAKITA (Shintaro), SUZUKI (Susumu), & KAGOSHIMA (Shigeru). [**Beiträge zur Kenntnis der Reiskrankheit des Geflügels.**] [Rice Disease in Birds.]—*Ni. Byor. Gak. K.* Tokyo. 1921. Vol. 11. pp. 83–103. [Summarized in *Japan Jl. Med. Sciences.* Tokyo. 1922. Vol. 1. No. 1. p. 4.]

It is maintained that rice sickness and beriberi are distinct. Examination of soya beans for protective properties showed that the fresh or dried coagulated bean albumen was very good, but if frozen and dried, or fermented, its action was almost negative. The vitamin activity of the urine as described by MÜCKENFUSS was not confirmed.

P. W. B-S.

RANDOIN (L.) & SIMONNET (H.). **Influence de la nature et de la quantité des glucides présents dans une ration privée de facteur B sur la précocité de l'apparition des accidents de la polynévrite aviaire.**—*C. R. Acad. Sci.* 1923. Nov. 5. Vol. 177. No. 19. pp. 903–906. With 1 chart.

FUNK and others have ascribed the symptoms of vitamin B deficiency disease to the excessive quantity of carbohydrate intake relative to the amount of vitamin B present, and FUNK observed that when glucose formed a high percentage of the diet the results were more marked. The authors' experiments show that in pigeons the symptoms are very rapidly produced when glucose or dextrin forms a high percentage of the diet ; birds fed upon potato starch (fécule) remained healthy for over three months. The results depend not only upon the amount of the carbohydrate but upon the proportion utilized by the digestive organs. The authors conclude also that the vitamin requirement is not absolute, fixed, and dependent on the animal itself, but that it is directly related to the amount of food assimilated, more particularly sugar. Curves of weight show the rapid fall when an excess of sugar was given, and the steady line in those fed upon the potato starch.

P. W. B-S.

SCURVY.

NASSAU (Erich) & MEYER (Olga). **Ueber die klinische Wirksamkeit einiger antiskorbutischer Nahrungsmittel.** [The Clinical Action of Certain Antiscorbutic Foods.] *Deut. Med. Woch.* 1923. Aug. 3. Vol. 49. No. 31. pp. 1016-1017. [3 refs.]

The observations were made at the Berlin clinic on about 50 infants suffering from moderate or severe scurvy. Many forms of vegetable foods were used, either as juice added to raw milk or made into purée. Efficacy was estimated by the time required to clear up symptoms, though this did not always mean cure of the disease, for the diathesis remains and relapses may occur. They showed that the symptoms disappeared in slight cases in less than 8 days with cherries, tomatoes, and turnips ; in 8 to 10 days with strawberries, currants, and bilberries ; in 10 to 14 days with gooseberries and lemons ; and in 14 days with raw milk. Results were negative with rhubarb, salads and red and white cabbage. The salads and cabbage were quickly given up as of little use [they were steamed, pressed, and the juice given to the children]. Lemon juice was not satisfactory [probably because old lemons were used]. The unheated milk of town cows was least useful ; 500 cc. or more was given daily. Improvement after treatment was first shown by a change of voice and increased cheerfulness ; in 5–10 days the appetite increased and evidence of dystrophy disappeared.

[The inefficacy of salads, cabbage, and lemon juice is rather remarkable, but the children are said to have disliked the carrot, cabbage, and salad juice and possibly did not take enough.]

P. W. Bassett-Smith.

PESCHIĆ (Svetosar). **Skorbut als infektiöse Krankheit. Die grosse Skorbutepidemie im Jahre 1917.** [Scurvy as an Infectious Disease.] – *Ztschr. f. Klin. Med.* 1923. Vol. 97. No. 1-3. pp. 169–181.

The author from his experience during the war concludes that scurvy is an infectious intestinal disease with an incubative period of about 7 days, the exciting cause being probably a bacillus of the colon group (" *B scorbuti* ") ; that it is spread in particles of excrement, either directly or through water ; and that it can be combated successfully by the hygienic measures suggested by this theory—of which, however, he offers no experimental proof, his conclusions being based chiefly on epidemiological data, though the faeces of 40 cases were investigated bacteriologically.

[It is probable that intestinal bacteria played a very important rôle in the spread of scurvy (over 2,000 cases) in the land forces during the early part of 1917 ; McCARRISON and others have shown that intestinal bacterial infections are commonly present where vitamins are deficient.]

P. W. B-S.

ZILVA (Sylvester Solomon). **The Influence of Reaction on the Oxidation of the Antiscorbutic Factor in Lemon Juice.**—*Biochem. Jl.* 1923. Vol. 17. No. 3. pp. 410–415. With 3 text figs. [7 refs.]

In these experiments the relation of oxidation and reaction to the inactivation of the anti-scorbutic factors was investigated. All the experiments were made with guineapigs, and charts demonstrate the results. It was found that in decitrated lemon juice, the destruction of the factor is due to a process of oxidation which proceeds rapidly in alkaline solutions and slowly in acid media. Under anaerobic conditions alkaline reactions seem to have no inactivating influence, while in the presence of air when the Hydrogen-ion concentration is raised, the destruction of the anti-scorbutic potency is delayed.

P. W. B-S.

ZILVA (Sylvester Solomon). **A Note on the Conservation of the Potency of Concentrated Antiscorbutic Preparations.** *Biochem. Jl.* 1923. Vol. 17. No. 3. pp. 416 417. [2 refs.]

It has been shown that decitrated lemon juice in a concentrated form has a therapeutic value in the treatment of infantile scurvy ; but these concentrated preparations deteriorate on keeping and are therefore less valuable for prophylaxis. By the method of preparation now described a stable concentrated solution can be made which, as shown by animal experiment, remains potent for over three months. The method is to deacidify, concentrate, make slightly acid, and preserve anaerobically.

P. W. B-S.

LIOTTA (Domenico). **Sullo scorbuto sperimentale. Nota II.—L'influenza della costipazione intestinale nello sviluppo dello scorbuto.**—*Arch. di Farmacol. Sperim. e Sci. affini.* Rome. 1923. July 1. Year 22. Vol. 36. No. 1. pp. 1-5. [6 refs.]

From clinical examination and pathological findings of experimental scurvy in guineapigs, the author concludes that the factor of constipation must be absolutely excluded from the contributory causes of death. Neither in the control guineapigs nor in the others systematically purged was there any abnormal dilatation or obstruction of the caecum nor any evidence that purges or disinfectants had any influence in preventing the haemorrhagic symptoms.

P. W. B-S.

LIOTTA (Domenico). **Sullo scorbuto sperimentale. Nota III. Le modificazioni emoleucocitarie.**—*Arch. Farmacol. Sper. e Sci. affini.* Rome. 1923. Sept. 1. Year 22. Vol. 36. No. 5. pp. 76–80. [15 refs.]

The weekly examination of two guineapigs with experimental scurvy showed a slight progressive reduction of the red cells and haemoglobin with a slight rise in the total leucocyte count, and changes in the relative white count, viz. progressive increase in the mononuclears and eosinophiles. These changes are ascribed to alterations in the endocrine organs dependent upon the condition of avitaminosis, the eosinophilia probably to some abnormal disintegration of proteins.

[The cellular constituents of the blood of guineapigs often vary greatly from time to time, and the total white count found in these two cases (5,900 & 5,200) is unusually low.]

P. W. B-S.

BESSESEN (D. H.). **Changes in Organ Weights of the Guinea Pig during Experimental Scurvy.**—*Amer. Jl. Physiol.* 1923. Jan. 1. Vol. 63. No. 2. pp. 245–256.

The animals tested were divided into six groups, each fed upon the same scorbutic diet for 5, 10, 15 and 19 days before being killed. Those of the fifth group died from the disease after 21 to 54 days (a very long period); those of the sixth group, after 19 to 22 days, were cured by appropriate diet. The changes in the carefully weighed organs were compared with normals worked out by BESSESEN & CARLSON in 1922. The paper is interesting but is too full of detail to be adequately abstracted. Generally speaking it confirms the work of McCARRISON. In most cases for the first 15 days the changes were comparatively slight, but when scorbutic symptoms became evident the organs most altered were the suprarenals which increased from 78 to 270 per cent. The spinal cord, lungs, kidneys, testicles and hypophyses were also increased in weight. The results found in scurvy and starvation are to a certain extent explainable as due to inanition, but there are marked differences in some organs, indicating that the scorbutic condition involves factors producing changes in weight differing from those found in ordinary inanition.

P. W. B-S.

UNDULANT FEVER.

CANTIERI (Collatino). **Polisierosite e febbre di Malta.**—*Riforma Med.* 1923. July 16. Vol. 39. No. 29. pp. 680–683. [12 refs.]

The occurrence of multiple serous effusions is common in tuberculosis, and has been found in typhoid infections. The author now describes a case of undulant fever in a man aged 21 in which a similar condition was present.

He had a history of typhoid and malaria during the war. In April 1922 he had pain in the left hypochondrium, followed in 10 days by an intermittent and remittent fever, attended with headaches, sweats, articular pains, and enlarged spleen. Serum reactions for T, A and B were negative, but positive for *M. melitensis* 1/500. Lungs normal, no T.B. Urine negative. After 35 days an apyretic period occurred. There was a double pleuritic effusion for which he was tapped; the fluid contained mostly lymphocytes. The belly was tumid with some fluid. The fever was of an undulant type. In September there was right orchitis with pain, and the spleen was still enlarged. The serum remained strongly positive for *melitensis*, but the cuticular reaction was negative. On 13th January the general condition was good, but with slight pulmonary signs; the testicle was normal.

Was this a tubercular condition or was the serositis due to the *melitensis* infection? The character of the fever, the serum reactions, and late orchitis were in favour of the latter. A similar but fatal case has been reported by TOZZI and is quoted rather fully by the author.

P. W. Bassett-Smith.

ORPEN (L. J. J.). **A Method of Blood Culture in Undulant (Malta) Fever and other Diseases.**—*S. African Med. Rec.* 1923. July 28. Vol. 21. No. 14. p. 325.

The author describes the following method, which he has found to be very successful, for isolating *M. melitensis* from the blood. 10 cc. of blood are citrated, twice centrifuged with normal saline solution, and the red cells and organisms taken up in a pipette. 1 cc. is added to a tube of agar at 40° C. which is then poured into a petri dish. Four plates are made and incubated at 37° C. The organisms can be picked off for identification from the second to the sixth day. This method he finds to be better than the ordinary broth culture, or blood clot method of TIZZANI.

[BASSETT-SMITH does not consider TIZZANI'S method to be the best.]

P. W. B-S.

MONTAGNANI (M.). **L'intradermoreazione nel tifo, paratifo A e B e nella febbre melitense con i filtrati di cultura. (Contributo clinico e sperimentale.)**—*Riv. Crit. di Clin. Med.* 1923. Apr. 5. & 15. Vol. 24. Nos. 10 & 11. pp. 149–156; 161–163. [33 refs.]

The author states that the logical conclusions to be drawn from a careful study of the intradermal reaction, chiefly from the clinical and practical point of view, are the following:—

1. There is a very clear and profound difference between the intradermal reaction produced by tuberculin in tuberculous cases,

and that given by filtered cultures as recommended by BURNET, whether of the typhoid or melitensis groups, in enteric and undulant fevers.

2. Contrary to the views of BURNET he holds that the reactions produced by the filtrates are not specific, as severe reactions may be produced in other morbid conditions and even in healthy persons of any age.

3. The difference in the results depends not only on the quality but also on the quantity of the filtrate used.

4. An intradermal reaction, if it be positive, does not confirm, or if a negative, does not disprove with certainty a suspected diagnosis, and it is therefore impossible to accept these reactions as of real practical value.

[No doubt further independent studies will be carried out to determine whether BURNET or Montagnani is correct.]

P. W. B-S.

TRENTI (Enrico). **Reazione cutanee nell' infezione da micrococco melitense.**—*Policlinico.* Sez. Prat. 1923. Sept. 24. Vol. 30. No. 39. pp. 1249–1254. [14 refs.]

The author reviews the diagnostic methods which have been proposed for undulant fever with particular reference to the intradermal test of BURNET. He describes the technique used and applied it to three groups of cases.—(1) Animals infected experimentally. (2) Human cases of undulant fever. (3) Cases of other diseases. In the first he found positive reactions from the tenth day after inoculation and lasting about 30 hours. In the second group of 9 cases, the intradermal tests was positive in all, agglutination was positive in seven, blood culture was positive in the six tested. In the third group of 70 cases, all were negative. He concludes that the introduction intradermally of 0·05 to 0·1 cc. of a filtrate of a twenty days' growth of broth culture gives an absolutely diagnostic reaction for undulant fever in man and guinea-pig. The procedure is of easy application, free from risk, and should be specially useful in detecting healthy carriers.

[These results support the observations of BURNET and are in direct opposition to those of MONTAGNANI.]

P. W. B-S.

BURNET (Et.). **Evolution et manifestations chroniques de l'infection à** *M. melitensis*, **en particulier d'après la maladie expérimentale du cobaye.**—*Arch. Inst. Pasteur de Tunis.* 1923. July. Vol. 12. No. 2. pp. 213–221. [6 refs.]

In guineapigs after infection with *M. melitensis* there is a septicaemia complicated with osteitis, arthritis, orchitis, and evidences of suppuration; in the liver, lungs and spleen granulomata form which become caseous or turn to abscesses. It was the author's object to show the evolution of these phenomena. After the inoculation of 100 million *M. m.* he recovered the organism on the 3rd day from the blood, glands and spleen; on the 8th day from the blood and organs, and agglutination was 1/80; on the 11th day agglutination was 1/200, the organism was present in the blood and glands but not in the urine; on the 18th. day all the glands were large, spleen congested, grey and white nodules were found in the liver and spleen, and cultures were positive. This is the period of arrest and fixation of the microbe. This state lasts several months. The nodules in the liver and lungs are very typical and the animal is ill. After 6–8 months the great majority of the guineapigs are strong and big. The young suffer most, like those infected with tubercle, but the *M.m.* does not kill guineapigs: laboratory deaths are due to secondary infections. After 12 to 16 months the post-mortem appearances are as if a cure was being effected.

The results differ from those found in man and goats, but a study of them helps to complete our knowledge of the disease in man and goats, especially as the early stages are known only in monkeys.

In inoculated goats during the first few days the organism is not found in the blood but is present in the spleen, where it multiplies and then is distributed, causing a secondary septicaemia. In the spleen and glands the organism is slowly destroyed, being found last in the milk. In man and guineapigs it is eliminated in an irregular manner in the urine. In man the spleen is most affected; the high fever signifies a greater resistance and more active destruction of the microbe in the blood; the septicaemic phase is more marked and more contested and the localization in the tissues reduced to a minimum.. In goats the fever is less marked and localization takes place mostly in the mammary gland. Guineapigs are the most sensitive, the septicaemia establishes a general glandular infection with the formation of nodules in which the organism is killed, and the animal appears to recover, but, as in chronic tuberculosis, it still remains infected.

P. W. B-S.

EVANS (Alice C.). **Experimental Abortion in a Cow produced by Inoculation with** *Bacterium melitensis.* -*Public Health Rep.* 1923. Apr. 20. pp. 825–826.

A pregnant heifer was inoculated intravenously with one slope in 10cc. of saline solution of a human strain of *M. melitensis.* The animal aborted in six weeks; the organism was recovered from the stomach, intestines, and peritoneal fluid of the foetus and also from the colostrum. The recovered strain is said to have been similar to that inoculated. The blood serum of the heifer agglutinated in low dilutions (1/10 & 1/20) both *melitensis* and *abortus* before inoculation, but afterwards to 1/300, practically equal to both. This rise in the agglutinins to about an equal titre and the resemblance of the infection to that which would have been produced by a bovine strain of *B. abortus* point to the identity of the organisms.

P. W. B–S.

BURNET (Et.). **Quelques faits relatifs à la possibilité de vacciner la chèvre contre le** *Micrococcus melitensis.*—*Arch. Inst. Pasteur de Tunis.* 1923. July. Vol. 12. No. 2. pp. 205-212. [3 refs.]

The author carried out tests on the young of healthy mother goats to see whether immunity could be produced by prophylactic inoculations. No immunity was obtained. From the many experiments made it was found that though the micrococcus was rarely found from the 112th to the 230th day post mortem, it was occasionally detected in the kidney. The view is held that the micro-organism is very difficult to eradicate from infected goats, as it remains hidden in certain centres.

P. W. B-S.

BURNET (Et.). **Réactions irrégulières au filtrat de bouillon de culture chez les chèvres infectées de** *Micrococcus melitensis*. –*C.R. Acad. Sci.* 1923. Aug. 6. Vol. 177. No. 6. pp. 414–416.

On the assumption that if the intradermal reaction found in man and guineapigs was also reliable in goats, it would be a very valuable test, the author carried out a number of experiments. He injected the filtered culture near the upper eyelid, or beneath the ear so as to demonstrate the oedema of a positive reaction. The results were very inconstant; in some animals it was very marked, in others (proved by blood culture, lacto-reaction, and serum agglutination, to be at the time infected) *it was negative*. He divides the results into three groups — (1) Positive serum agglutination and dermo-reaction, 2·5 per cent. (2) Negative agglutination and positive dermo-reaction, 9·5 per cent. (3) Positive serum agglutination and negative dermo-reaction, 3·3 per cent. The author concludes that in the present condition of our knowledge the dermo-reaction is not a practical test for the infection of goats, but he notes that those goats which received a suitable dose of the filtered culture had a temperature reaction, which may in the future possibly be useful as a diagnostic test.

P. W. B-S.

EVANS (Alice C.). **The Serological Classification of** *Brucella melitensis* **from Human, Bovine, Caprine, Porcine, and Equine Sources.** –*Public Health Rep.* 1923. Aug. 24. Vol. 38. No. 34. pp. 1948-1963. With 1 chart. [22 refs.]

The author describes the agglutination and absorption reactions of 49 strains; one only was of caprine origin and 15 were human, but the English ones were old, 1907 & 1908.

1. These 49 strains could be differentiated into at least 7 serological groups, but 4, containing one or two strains each, were relatively unimportant.

2. The majority of the bovine and porcine strains fell into one large group (30 strains), Var. " abortus." Two small groups may be classed as sub-varieties of this (1 bovine and 2 human strains).

3. Another group includes 11 strains, human, bovine, equine and caprine, and is called Var. " Br. melitensis A."

4. A third group, of three strains, is characterized by the preponderance of coccoid cells. It is important that this was the variety that BRUCE was working with; it is called Var. " Br. melitensis B."

Simple agglutination tests cannot differentiate between abortus and melitensis A varieties, but these two can be differentiated from melitensis B variety by the simple agglutination test when the titre of the serum used is accurately known for the several varieties. We have thus 3 chief strains– (1) Abortus, almost entirely animal. (2) Melitensis A, of very mixed origin. (3) Melitensis B, the original *Micrococcus melitensis* of BRUCE, distinguishable from the others by simple agglutination tests.

It is important to note that besides the 49 strains originally tested 9 further strains, human and caprine, were received from BURNET, Tunis, These were not identical with any of the types already made, but were more closely related to the " Br. melitensis B" (that is to the original BRUCE type) than to the other serological groups and they appeared to be poor anti-body producers, agreeing in some factors with *M. paramelitensis.*

[*M. paramelitensis* was described by NÈGRE & RAYNAUD in 1912 as *M. paramelitensis* Br. No finality as to the specificity of the Abortus-melitensis organisms can be derived from this paper, but it rather favours the view that the human melitensis is a different organism as found in the original endemic areas, though the author definitely states that all the forms belong to one species.]

P. W. B-S.

EVANS (Alice C.). **The Nomenclature of the Melitensis-Abortus Group of Bacteriological Organisms.**—*Public Health Rep.* 1923. Aug. 24. Vol. 38. No. 34. pp. 1943–1948. [17 refs.]

In accordance with the rules of nomenclature of the Society of American Bacteriologists the author repeats that the abortus-melitensis group should be placed in a separate genus " *Brucella* " (Meyer & Shaw). There is, however, some doubt whether the latter genus should give way to the genus " Alkaligenes " of CASTELLANI and CHALMERS which would have priority if the difference between *A. foecalis* and abortus are insufficient for generic distinction ; in this case the genus would consist of *A. foecalis*, the Brucella group, and also probably include *B. bronchiseptieus.* If the generic term " Brucella " is valid, the abbreviation Br. should be employed, and *Br. melitensis* would have priority over *Br. abortus-melitensis* as a specific name, but would include all varieties *Br. abortus, Br. Melitensis* A & B.

[The nomenclature of organisms will be greatly complicated if varieties are to receive separate names — *Brucella melitensis* var. *Abortus,* var. *Melitensis* A., var. *Melitensis* B.]

P. W. B-S.

DENGUE GROUP OF FEVERS.

MEGAW (J. W. D.). **The Dengue-Sand-Fly Fever Problem.**—*Indian Med. Gaz.* 1923. Sept. Vol. 58. No. 9. pp. 401–406. With 4 charts. [4 refs.]

The nomenclature of the short fevers found in the tropics is generally recognized as being very difficult, and the relation of one fever to another is uncertain. The confusion has been increased by the tendency to make new diseases and to give misleading names. Until the etiological agent of each has been discovered the separation of so many similar conditions by clinical characters is extremely unsatisfactory. The work of COUVY and WHITTINGHAM indicating a spirochaetal origin is therefore of great importance. The conception that dengue must have a short two-phase fever, with break bone pains and secondary rash, is misleading; in actual practice great variation of symptoms is seen in different epidemics and even in cases of the same, almost the only constant feature being the short duration. [The reviewer experienced three marked epidemics of dengue fever at Bombay in the Fleet when a great variety of types was seen.] For these the term " Dengue-like " has often been used. Outbreaks of sandfly fever may show some cases of the seven-day type, and in dengue epidemics there may be many cases with a short form like that of sandfly fever. LOUGHNAN in describing " The short fevers of Jamaica " notes that they can be divided into three types, one like the seven-day fever of Calcutta, a second like classical dengue, and a third like phlebotomus fever but without the presence of sandfly carriers. This overlapping of forms has also been noticed by the author at Calcutta and has induced him to recommend that all these forms of fever lasting not more than 8 days shall be called dengue if no definite cause can be demonstrated, with the addition of a special designation as " mosquito " or " sandfly " if these are proved to be the carriers. Japanese seven-day fever differs etiologically, being due to a leptospira, and infects mice ; and it may be accompanied by jaundice.

The dengue and sandfly fevers described by COUVY from Asia Minor and by WHITTINGHAM in Malta are very important, but the author points out that in these the duration of the cycle is 11 to 12 days (viz. from onset of first pyrexia to the onset of the second) and that jaundice was noticed in one case. Immunity experiments have not so far given such conclusive results as would differentiate these fevers.

The author gives a table setting forth the characters of " the spirochaetal and related fevers "—Yellow fever, dengue group including mosquito-dengue, sandfly-dengue, and Couvy and Whittingham's dengue, the infectious jaundice group including Japanese seven-day fever and infectious jaundice, the relapsing fever group including louse-borne and tick-borne types, and finally rat-bite fevers. In this table the virus of mosquito and sandfly dengue is noted to be a filterable spirochaete [so far unproved]. This classification is put forward in the hope that it will help students " to form clearer ideas of the value and relationship of the members of the various groups," but the author acknowledges that further information may probably lead to considerable changes. Four typical charts are shown of the different fevers of the dengue group.

[The term Phlebotomus fever is now in general use and appears to be supported by abundant evidence and is unlikely to be displaced by that of sandfly-dengue. West Indian dengue as originally described shows few points of resemblance with the Phlebotomus fever described by BIRT. The unification of irregular types is, however, desirable. Th frequent substitution of the name LEDINGHAM for WHITTINGHAM is unfortunate, and might convey a suspicion of inaccuracy in other details.]

P. W. Bassett-Smith.

DE FARIA (Gomes). **Nota sobre a "*Leptospira couvyi*" n.sp. encontrada em um doente suspeito de dengue. (Nota prévia.)** [*L. couvyi* found in a Patient with Suspected Dengue.]—*Brazil Medico.* 1923. May 26. Year 37. Vol. 1. No. 21. pp. 287–288. With 2 text figs.

In a case of dengue in Brazil the author examined the blood about two hours after the fever commenced, and in one film found organisms having the appearance of leptospira. These were exceedingly delicate filaments with a tendency to hooking of the ends. They stained with difficulty, a fact borne out by the microphotograph which accompanies the paper and purports to illustrate the organism, which unfortunately it is impossible to detect. Another illustration, a drawing, shows clearly two organisms as tapering filaments with hooked ends. It is possible they represent leptospira, but as they were only seen in the single stained film it is difficult to have conviction on this point. The name *Leptospira couvyi* is given to the organism. Professor LUTZ, who examined the preparation, agrees with the author's diagnosis.

C. M. Wenyon.

BONNE (C.). **De dengueachtige ziekte van Suriname en gele koorts.** [The Dengue-like Disease of Surinam and Yellow Fever.]—*Geneesk. Tijdschr. v. Nederl.-Indië.* 1923. Vol. 63. No. 3. pp. 469–473.

This endemic fever previously described by the author (see this *Bulletin*, Vol. 16, p. 424) does not occur and does not spread, notwithstanding occasional importation into inland estates, where Stegomyia is absent. Stegomyia is considered to be the probable carrier. If so. the epidemiology of this dengue-like fever shows a striking likeness to that of yellow fever. The possibility is discussed of this dengue-like fever being an abortive type of yellow fever, a disease not endemic in Surinam and against which the native population appears to be immune.

W. J. Bais.

CAMERON (R. D.). **Notes on Sandfly Fever.**—*Jl. Roy. Army Med. Corps.* 1923. Nov. Vol. 41. No. 5. pp. 369–371.

The guard of one N.C.O. and 3 men at Mejidieh Fort, Chanak, was changed every day and several men who performed this duty were attacked by sandfly fever. It was therefore possible to obtain definite information as to the incubation period. The total number of cases was 38, and 28 per cent. of the guard were affected; sometimes 3 out of the 4 were attacked. The incubation period was never less than 2 or more than 7 days. During the summer 500 cases were admitted to the F.A. hospital, Chanak. The men who lived in old buildings suffered most, those in tents 100 yards off almost equally, but a few were infected in the open camp as much as two miles away from any buildings.

Of the 500 cases, 71 were readmissions; 15 per cent. had two attacks and 7 per cent. three. Nine of the 21 men who were at Chanak in 1923-24 were affected both years.

P. W. B-S.

ARMSTRONG (C.) **Dengue Fever.**—*Public Health Rep.* 1923. Aug. 3. Vol. 38. No. 31. pp. 1750–1784. With 3 charts. [172 refs.]

The author has collected and reviewed the literature of dengue fever, and supplies a very full bibliography.

P. W. B-S.

ROCKY MOUNTAIN SPOTTED FEVER.

NOGUCHI (Hideyo). **Immunity Studies of Rocky Mountain Spotted Fever. II. Prophylactic Inoculation in Animals.**—*Jl. Experim. Med.* 1923. Nov. 1. Vol. 38. No. 5. pp. 605–626. [2 refs.]

The possibility of preventive inoculation for the disease was recognised by RICKETTS and GOMEZ (1908). As the causative organism cannot so far be cultured dependence has to be placed on the results of immunity experiments in animals.

The author has shown that (1) Freshly prepared mixtures of spotted fever virus and immune rabbit serum in neutral or superneutral proportions confer complete immunity on guineapigs (viz. slight excess of immune serum over amount of virus). (2) The immunizing power of the mixture is reduced considerably when heated to 60° C. for 20 minutes, but is still useful in reducing the severity of the disease. (3) Prolonged storage in ice box also reduces its power. (4) The virus alone, or mixed with normal rabbit serum, when allowed to die out or when killed by heat or chemicals does not induce immunity in guineapigs. For immunizing man the heated neutral mixture of the virus and a highly potent immune serum, preferably from a guineapig, may be used, two doses of 1 cc. given subcutaneously.

The ultimate object of the experiments Noguchi states is to produce a method in which the active (unheated) sero-vaccine may be safely applied to man.

P. W. Bassett-Smith.

BULLETIN OF THE MONTANA STATE BOARD OF HEALTH, 1923. June. *Special Bulletin No. 26.* 49 pp. With 1 map.—**Rocky Mountain Spotted Fever. Conference of Health Officials of the Rocky Mountain States and Provinces held at Missoula, Montana, April 5th and 6th, 1923.**

The conference was held at the instance of the State Board of Health of Montana, and this report embodies papers from the principal specialists on the subject of Rocky Mountain Spotted Fever, including Drs. WOLBACH, NOGUCHI and PARKER. The diagnosis, symptoms, prevalence, and incidence are separately treated, and methods of suppression are discussed together with studies of the virus and prophylactic serotherapy. The greater part of the report, which is very complete, has already been published by the several authors, and reviewed in this *Bulletin.* A resolution was passed expressing approval of the excellent work done by the Public Health Service and the Rockefeller Institute, and petitioning that it be continued.

P. W. B-S.

LABORATORY METHODS.

SCOTT (R. E.) & FRENCH (R. W.). **Uniform Nomenclature for Blood Counting.**—*Milit. Surgeon.* 1923. Oct. Vol. 53. No. 4. pp. 321–327. [4 refs.]

This is a very laudable effort to standardize leucocytic nomenclature and classification " in keeping with the more recent work in cytological pathology, embryology and physiology." The standard given will probably commend itself to most workers, and the types of leucocytes recognized under this standard may well serve to unify and render comparisons useful. Though " experience," as the author says, " has proved that, for intelligent and uniform results in differential blood counting, a great deal of eye training with a thorough knowledge of blood cell embryology is essential," yet the adoption of a recognized standard on sound lines and capable of improvement as knowledge advances would be all to the good.

The types of leucocytes recognized in this standard nomenclature, under normal conditions, are :—

Small mononuclears (lymphocytes),
Large mononuclears (endothelial leucocytes),
Polymorphonuclear neutrophiles,
Polymorphonuclear eosinophiles,
Polymorphonuclear basophiles,

to which are added, under pathological conditions, any of the following :—

Lymphoblasts (embryonic lymphocytes).*
Neutrophilic myelocytes (embryonic polymorphonuclear neutrophile).
Eosinophilic myelocytes (embryonic polymorphonuclear eosinophile).
Basophilic myelocytes (embryonic polymorphonuclear basophile).
Myeloblasts (embryonic myelocytes).
Normoblasts (embryonic erythrocytes).
Megaloblasts (embryonic normoblasts).

In the classification of blood-cells nuclear structure, the relation of nucleus to cytoplasm, the size and staining reactions of certain cytoplasmic granules may all be factors to be taken into consideration. Nuclear structure is of special importance in differentiating between lymphoblast and lymphocyte or between normoblast and megaloblast. The differential count is a percentage count and should be considered along with the total count in order to appreciate actual, as distinguished from relative, increases or decreases, and to arrive at the absolute values per cmm. for the several cells. This method of analysis should be used in the study of all differential blood counts if the true pathological condition suggested is to be fully realized. Within normal and physiological conditions the total number of leucocytes per cmm. of the blood may vary between 4,000 and 12,000 and possibly as high as 15,000, and the differential count within the following limits :—

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*Plasma cells, or the so-called Turck or irritation cell, may form either from lymphoblasts or lymphocytes under certain irritative conditions little understood from a pathological standpoint, and generally speaking have little significance when seen in the peripheral blood.

Polymorphonuclear neutrophiles	65 to 72 per cent.
Polymorphonuclear eosinophiles	1 to 2 per cent.
Polymorphonuclear basophiles	¼ to ½ per cent.
Small mononuclears	20 to 30 per cent.
Large mononuclears	4 to 10 per cent

[The reviewer thinks that the terms " small " and " large " used as above are open to objection, and suggests as an alternative form of classification the following :—

- Polymorphonuclears
  - neutrophile
  - eosinophile
  - basophile
- Mononuclears
  - lymphocytes
  - endothelial leucocytes.]

The lymphocyte type of cell has its origin in the lymph tissues throughout the body, but more especially in the lymph nodes. It is not derived from the bone marrow.

The large mononuclear type is probably derived from endothelial cells lining blood, and to a less extent lymph, vessels by proliferation and desquamation. It is specially active as a phagocyte. The " so-called " transitional, considered to be a degenerating endothelial leucocyte, is included in this category and is not recognized as a separate class.

The polymorphonuclear types are probably derived from the bone marrow, passing successively through the stage of myeloblast and myelocyte to the differentiated and adult polymorphonuclear leucocyte with neutrophile, acidophilic and basophilic granules as the case may be. An increase of polymorphonuclear neutrophiles with an absence of eosinophiles indicates sepsis, while the presence of eosinophiles indicates either a chronic condition or resolution. The eosinophile is specially noticeable in intestinal tissue and its percentage in the blood is increased (both relatively and absolutely) in certain parasitic infections. An eosinophilia is also noted in certain acute tuberculous conditions and during recovery from any acute pyogenic infection.

The presence of any of the pathological forms of blood cells in the peripheral blood indicates an increased activity of the blood-forming organs, and the more embryonic the cells the more acute the process and the less favourable the prognosis.

Changes in Red Cells.—The types of degeneration recognized are :—

Polychromatophilia (change in staining reaction).

Basophilic stippling (change in staining reaction).

Achromia (loss of haemoglobin per cell).

Anisocytosis (variations in size).

Poikilocytosis (variations in shape).

All indicate a certain drain on the blood and may indicate a true disease of the blood-forming organs.

The presence of nucleated (embryonic) erythrocytes in the circulating blood has always a pathological significance, but in certain post-operative conditions may be a good sign. As indicated above, normoblasts and megaloblasts (the latter being the more embryonic) are the only types recognized in this standard classification.

J. D. Thomson.

SENEVET (G.). **L'emploi de la machine à écrire pour l'établissement des formules leucocytaires.**- *Arch. Instituts Pasteur de l'Afrique du Nord.* 1922. Dec. Vol. 2. No. 4. pp. 622 624.

The typewriter is placed in a convenient position so that it can be operated by the fingers of one hand leaving the other hand free for the microscope. The instrument is set for 50 spaces to the line. A " blank " or " space " is chosen to represent a polymorphonuclear neutrophile, while each of the other categories of leucocytes is represented by a " letter " —letters close together being chosen for those recurring most frequently so as to be within easy control. A sheet of paper is placed in position and the count is begun. At the end of each line of 50 spaces the machine is automatically arrested, and is then set for the next line. When the desired number of leucocytes has been counted (400 or 500 = 8 or 10 lines), the sheet of paper is removed and the letters representing each category counted. The difference between the sum of all the letters and the total leucocytes counted gives the number of polymorphonuclear neutrophiles.

If desired to do an Arneth's count, in place of a " blank " for each polymorphonuclear neutrophile a figure, 2, 3, 4 etc., is used to represent each, according as its nucleus has 2, 3, 4 etc. divisions.

With a little practice the method is rapid, easy and accurate. It can be interrupted at any stage and resumed again. The record can be preserved, the counting done at convenience and kept for future reference. For those who possess a typewriting machine the method is to be recommended.

J. D. T.

FAIRLEY (K. Douglas). **The Leucocytes in Health and in Disease.**—*Med. Jl. Australia.* 1923. June 16. 10th Year. Vol. 1. No. 24. pp. 655-676. With 1 fig. [55 refs.]

This important paper should be read *in extenso.* The author takes, first, the leucocytes of normal blood. Showing from his own observations that the total leucocyte count in normal adults may vary between 4,500 and 15,000 per cubic millimetre, he argues that too much importance must not be attached merely to a fairly high leucocyte count, and emphasizes the proposition that it is not so much the total, or the particular percentage, of the various cells present, but the detection of certain pathological forms that constitutes the value of blood examinations; and he also lays stress on the impossibility of making a diagnosis,in a difficult case, upon a single examination. The argument is illustrated by a table showing the percentage and absolute numbers of leucocyte counts in 29 apparently normal young doctors (15 female and 14 male) at the Melbourne Hospital—a table rather too long to reproduce. We may, however, introduce the summary of the 36 observations on these 29 young adults to justify the author's contention that the accepted formulae for normal leucocyte-proportions need revision.

TABLE II.—THE AVERAGE, MINIMUM AND MAXIMUM LEUCOCYTE COUNTS IN TWENTY-NINE NORMAL ADULTS.

Leucocytes.	20 Counts on 15 Females.			16 Counts on 14 Males.			36 Counts on 29 People.
	Absolute numbers per cmm.			Absolute numbers per cmm.			Absolute Nos. per cmm. and Percentage.
	Ave.	Min.	Max.	Ave.	Min.	Max.	Average.
Polymorpho. Neutroph.	5,400	3,700	8,800	4,250	2,525	6,420	4,825 (54·4%)
Polymorpho. Eosinoph.	150	20	315	120	35	400	130 (1·5%)
Polymorpho. Basoph.	35	—	100	35	15	80	35 (0·4%)
Lympho., Large and Small	3,380	1,650	6,050	3,520	2,450	6,350	3,460 (39·1%)
Large Mono. and Transit... ...	400	125	725	400	200	750	400 (4·5%)

The author next deals with the leucocyte response to disease, which he considers under two conditions, namely (1) where there are no pathological immature leucocytes circulating in the blood, and (2) where, as in the leukaemias, these immature elements are present. (1) In the first class of cases the leucocyte response varies with the type of tissue infected, the infecting organism, and the course of the disease: generally though by no means always there is a neutrophile polymorphonuclear response to coccal infections, an eosinophile response to helminth infections, a lymphocyte response to bacillar infections, and a reaction of the endothelial leucocytes to protozoa (*e.g.* malaria). (2) Going on to the leukaemias the author presents a careful study based on 41 cases—11 acute, 25 chronic myeloid, and 5 chronic lymphatic—treated in the last thirteen years in the Melbourne Hospital, the study embracing blood phenomena, differential diagnosis, and pathology. The relations of lymphosarcoma, leucosarcoma, Hodgkin's disease, and chloroma are discussed, and then aetiology and treatment. The following are the author's main general conclusions:—

"1. McJunkin and Charlton's special stain for endothelial cells is very useful in distinguishing between the large lymphocytes and the large mononuclear cells of the blood.

"4. In the diagnosis of acute leuchaemia care should be exercised to exclude acute infective lymphoblastosis, as the prognosis in the two conditions is quite different.

"5. Lympho-sarcoma, leuco-sarcoma and lymphatic leuchaemia are probably merely different manifestations of the same disease, and are better grouped under the term lymph-adenosis, leuchaemic and aleuchaemic.

"6. The term Hodgkin's disease should be limited to those cases which show the typical histological changes which enable a definite diagnosis and prognosis to be made. It is probably aetiologically entirely distinct from lymph-adenosis.

"7. Pappenheim's conception of the rôle of the reticulo-endothelial system enables these different conditions to be appropriately considered as variations of a single pathological process.

" 8. These allied conditions are probably the result of the action of toxic agents widely diffused throughout the body. Such toxic agents are probably derived from living organisms.

" 9. The investigation of the leucocytic response in leuchaemia following the intravenous injection of foreign protein may lead to further information with regard to the differentiation of the immature white blood corpuscles and of the functions of the leucocytes.

" 10. The loss of power of production of antibody is certainly not invariable in leuchaemia."

A. Alcock.

McJunkin (F. A.) & Charlton (Alice). **The Practical Identification of Endothelial Leukocytes in Differential Blood Counting. Fourth Report of Studies on the Mononuclear Cells of the Blood.** -*Arch. Intern. Med.* 1918. Aug. 15. Vol. 22. No. 2. pp. 157-159. With 1 plate. [3 refs.]

In an article entitled " A Simple Technic for the Demonstration of a Phagocytic Mononuclear Cell in Peripheral Blood " published in *Archives of Internal Medicine*, 1918, Vol. 21. No. 1, pp. 59-65, McJunkin described a method by which it was shown that the large mononuclear cells of the blood, usually differentiated by their morphological characters and staining reactions, take up lamp black and can be recognized with certainty by the presence of the carbon particles massed within their cytoplasm. In morphology and in phagocytic properties these large mononuclear cells of the blood correspond to the endothelial leucocytes of the tissues and are probably of endothelial origin. The technique on which the results and conclusions were based was fully described, but even slight variations of that technique usually yielded negative results and the author was unable to recommend it as a routine method for the identification of this class of leucocyte in differential blood counts.

The present article is concerned with a staining reaction which brings out characteristic cytoplasmic granules in the endothelial leucocytes. " The granules stain blue in a solution of alphanaphthol-methyl-violet." Details connected with the preparation of the stain, the technique employed, and the reaction of blood cells to the stain are given. Blue staining granules also occur in polymorphonuclear neutrophiles and eosinophiles, but not in lymphocytes. " The differential character of the endothelial leukocyte is the presence of blue granules in a mononuclear cell." The conclusions drawn are, "The endothelial leukocytes of the peripheral blood can be stained differentially. That the stain is specific is shown by staining blood in which this variety of leukocyte is characterized by ingested carbon."

[The method here described has certain practical disadvantages especially connected with the preparation of the stain. It may be useful in exceptional cases and as an occasional check, but in everyday routine differential counts reliance will still be placed on experienced recognition of the morphological characters and the staining reactions by which these large mononuclear leucocytes (the recognized phagocytic properties of which McJunkin demonstrated by the lamp-black method referred to above) have usually been differentiated.]

J. D. T.

BARLOW (D. L.). **A Simplified Method of preparing a Modified Romanowsky Blood Stain.**—*Med. Jl. Australia.* 1923. July 28. 10th Year. Vol. 2. No. 4. p. 90. [1 ref.]

TERRY (B. T.), in the *Journal of Laboratory and Clinical Medicine*, 1922, Vol. 8, No. 3, describes a new process for the rapid preparation of polychrome methylene blue, the technique of which is as follows:—

A solution of 1 per cent. pure methylene blue and of 0·5 per cent. anhydrous sodium carbonate in distilled water is brought to boiling point in a porcelain dish and kept gently boiling for two and a half minutes. It is then cooled and 500 cc. of a 0·1 per cent. solution of yellowish water-soluble eosin are slowly added. A precipitate forms and is separated off by filtration and dried.

The author of the present article uses a half-saturated solution of the dried precipitate prepared as above in pure methyl alcohol (free from acidity and acetone) for staining blood films. The pure stain is allowed to act on fresh unfixed films for one and a half minutes. It is then diluted with 2 volumes of distilled water and allowed to act for three minutes longer. The films are finally washed with distilled water.

The purity of the methyl alcohol is of great importance, as the polychrome stain loses all its best qualities if dissolved in an alcohol containing the least trace of impurity. The distilled water should be neutral.

The chief advantages claimed for this stain are its ease of production and its richness in polychrome qualities.

J. D. T.

IOFF (I.). **Beschleunigte Färbung des Dicktropfenpräparats.** [Rapid Staining of Thick Drop Preparations.]—*Rev. Microbiol. et Epidemiol.* Saratov. 1923. Vol. 2. No. 1–2. In Russian pp. 68–69. Abridged Version in German p. 95. [1 ref.]

The author, according to the abridged version, used the following stain:—1 per cent. methylene blue 4 parts, 1 per cent. fuchsin 1 part, 1 per cent. acetic acid 4 parts, distilled water 40 parts. In this the films are dehaemoglobinized and stained in from 5 to 15 minutes according to the thickness of the preparation. They are then thoroughly rinsed, dried, and examined with an oil immersion lens. An ideal stain, the author says, is still to be found for thick drop preparations.

[Dry, unfixed, thick-drop preparations of blood may be dehaemoglobinized and stained simultaneously if placed vertically in a suitable vessel containing any appropriate aqueous stain.]

J. D. T.

MOSCHKOWSKI (Sch.). **Eine einfache Methode zur Schnellfärbung von Blut und Blutparasiten.** [A Simple Method for the Rapid Staining of Blood and Blood Parasites.]—*Cent. f. Bakt.* 1 Abt. Orig. 1923. May 4. Vol. 90. No. 4. pp. 296–299. [9 refs.]

This quick staining method is recommended by the author more especially for "mass examination" of blood and organ smears, being suitable for blood morphology and for staining malarial parasites, trypanosomes and leishmania.

Solutions required. 1. A borax methylene blue solution, similar to MANSON'S but about half the strength, may be prepared by rubbing up in a mortar 1 gramme of methylene blue and 2 grammes of borax and dissolving the mixed powder in 100 cc. of hot water (about 90° C.); or the borax may first be dissolved in the boiling water over a flame and the methylene blue added after removal from the flame. In either case the solution after cooling is filtered. For use it must be diluted 3 to 5 times with water.

2. A saturated watery solution of tannin may be prepared, filtered, and kept in a stoppered flask with a small pieece of camphor or of thymol added as a preservative. For use this solution has to be diluted 8 to 12 times with water, making a dilution of about 2 to 5 per cent. of tannin.

Staining. The preparations to be stained should be fixed for a somewhat shorter time than is usual, not longer than from 5 to 10 minutes, in 96 per cent. ethyl alcohol, or from 1 to 2 minutes in methyl alcohol.

It is convenient to have two vessels (one for the diluted stain and the other for the diluted tannin solution) of such a size that one can readily immerse and withdraw from them a slide (or two slides placed back to back) near each other, and close to a tap or large vessel containing tap water.

The preparation (fixed as above) is now immersed in the diluted stain for 2 to 5 seconds, removed, carefully rinsed in tap water, and then immersed in the dilute tannin solution for 1 to 3 seconds, after which it is again rinsed in tap water and allowed to dry. The whole procedure (exclusive of drying) lasts about 10 seconds.

The tannin solution must be replaced when it becomes green. The diluted staining solution retains its staining properties for months.

It is not necessary to be painfully particular about the dilutions. Alterations in concentration and variations in time (within the limits given) lead to variations in tint or tone.

The coloured preparation somewhat resembles a Giemsa preparation. Erythocytes stain rose to reddish violet—polychromatophilia being easily recognized. The nuclei of leucocytes stain red, neutrophile granules faint reddish, while eosinophile granules remain unstained. Eosinophiles are recognized by their protoplasm being filled with clear unstained granules. The cytoplasm of lymphocytes stains blue, that of " monocytes " [endothelial leucocytes] grey blue. Platelet granules stain faint reddish.

The cytoplasm of malarial parasites stains blue. The pigment is clearly defined. Schüffner's dots stain faint reddish. The nuclei of the ring-forms and of the younger schizonts stain deep red, those of the older parasites appear much fainter, while those of the gametocytes are hardly visible.

In smears of oriental sore the leishmania stand out sharply. The cytoplasm stains bluish, the nuclei red to reddish violet.

The cytoplasm of trypanosomes stains blue with metachromatic inclosures, while the nucleus, kinetonucleus, and flagellum are faintly stained.

A long excursion by doubtful and devious paths into the uncertain nature of the reactions is next undertaken by the author, but it is not necessary for us to accompany him.

J. D. T.

FRENCH (R. W.). **Acetic-Alcohol Fixation for Parasitic Amoebae and for Tissues.**—*Amer. Jl. Trop. Med.* Baltimore. 1923. May. Vol. 3. No. 3. pp. 213–223. With 3 plates.

Carnoy's fixative, consisting of absolute alcohol 6 parts, chloroform 3 parts, and glacial acetic acid 1 part, is here recommended as excellent for almost any of the staining methods, but especially useful when followed by haematoxylin. It is used cold and ensures quick killing, rapid fixation, and fidelity of tissue elements when followed by haematoxylin stains.

Smears on cover-glasses or on slides, as soon as made and before they can dry, are immersed in the freshly prepared fixative for 10 to 15 minutes—

10 being ample for complete fixation of average smears. Over-fixing is to be avoided. When removed from the fixative they are washed in one change of absolute alcohol and then immersed in fresh absolute for 10 to 20 minutes and afterwards in 95 per cent. alcohol for 10 to 20 minutes, followed by distilled water for 10 to 20 minutes longer, before being stained.

For tissue fixation (1) Immerse small pieces of the tissue in freshly prepared fixative for 1 to 2 hours. (2) Wash in absolute alcohol (one change). (3) Immerse in absolute alcohol for 1 to 3 hours. (4) Blot off the alcohol and immerse in chloroform for 1 hour, and in fresh chloroform for another hour and a half. (5) Transfer to chloroform and paraffin for 2 hours to overnight. (6) Paraffin alone for 1 to 2 hours. (7) Embed. In this way good paraffin sections, well-fixed and well-stained, can be obtained in from 8 to 10 hours.

J. D. T.

TRANSACTIONS OF THE ROYAL SOCIETY OF TROPICAL MEDICINE AND HYGIENE. 1923. Mar. 15 & May 17. Vol. 17. Nos. 1 & 2. pp. 1-2.—**Laboratory Meeting.**

Dr. A. C. STEVENSON showed sections from leprosy tissue stained by Fontes' method.

"This method is as follows :—(1) Stain with warm carbol fuchsin and decolourise, as in Ziehl Neelsen. (2) Wash well in water to get rid of acid. (3) Stain by Gram's method, and counter-stain with Biswarde [Bismark] brown or orange G. Sections or films as stained show well the acid fast and the varying degrees of non acid fastness of the leprosy bacilli, and bring out the same variations in the granules in the bacilli themselves. The sections also illustrate the varying acid fastness of the leprosy bacilli in different cases.

"A section stained in the same manner, demonstrating tubercle bacilli in a guinea-pig inoculated from a pure culture, was also shown for comparison."

J. D. T.

YAKIMOFF (W. I.). **Note sur la technique bactériologique. Procédé d'Orticoni.**—*Bull. Soc. Path. Exot.* 1923. Apr. 11. Vol. 16. No. 4. p. 226.

As a quick means of diagnosing typhoid and paratyphoid M. ORTICONI (1915) recommended the addition of glucose as well as of bile to the nutrient medium for the blood culture. To 1,000 cc. of ordinary bouillon he added 2·5 gm. of glucose and sterilized for half an hour at 105° C. To 100 cc. of this glucose bouillon he added 2 to 3 cc. of filtered and sterilized ox bile just before introducing 10 to 15 cc. of the patient's blood obtained aseptically.

The bacilli of both typhoid and paratyphoid grow in the presence of bile, but while those of the latter ferment glucose, those of the former do not. The author of this communication says that he has found ORTICONI's recommendation very useful in reducing considerably the time required for diagnosis. While the culture with bile alone requires at least 18 hours and the further differentiation of typhoid from paratyphoid other 12 to 18 hours, he finds that the whole examination by the combined method is reduced to about 12 hours and that further differentiation is superfluous.

J. D. T.

ENLOWS (Ella M. A.). **A Sugar-Free Medium for Fermentation Studies.**—*Public Health Rep.* 1923. Sept. 14. Vol. 38. No. 37. pp. 2129–2132. [2 refs.]

Having found that beef and horse meat infusion broths vary greatly in their carbohydrate content, the author of the present article, after testing varying combinations, recommends the following formula to produce a sugar-free medium adapted for fermentation studies and varying from pH 7·2 to pH 7·4 (the hydrogen ion concentration near which a great number of the pathogenic and allied organisms grow best).

Tap (or distilled) water	1,800·0	cc.
Peptone	10·0	grams.
Na_2HPO_4	14·5	„
KH_2PO_4	1·4	„
Agar	2·0	„

To this the fermentable substance and the indicator are added. The indicator used in the first instance is prepared as follows :—

Brom thymol blue	0·1	gram.
N/20 NaOH	3·2	cc.

Grind in agate mortar. When solution is complete, add 3 cc. of distilled water. 3 drops of this "in each 500 cc. make a medium with very positive color change due to increased hydrogen ion concentration." Lest attack upon the peptone should be considered as obscuring the results of the carbohydrate attack, the medium with indicator but without the addition of fermentable substance is used as " non-fermentable controls "

Two lists are given, one of organisms that have been grown on this medium with characteristic results and the other of fermentable substances tested. The article ends with the following summary :—

" A medium has been devised containing a sugar-free base, to which fermentable substances and the indicator brom thymol blue may be added, which serves for fermentation studies on a large number of bacterial species. The medium is based upon the low-percentage agar medium of Hitchens, substituting a synthetic, sugar-free base for the beef broth used by him.

" The medium is easily prepared, and very economical, making its use advantageous for testing the purity of large numbers of stock cultures or for classroom demonstration. Actual growth of the organisms under test is readily observed because of the clarity of the medium ; and the medium will support the growth of a large number of micro-organisms either with or without the addition of carbohydrate or other fermentable substance. Anaerobes as well as aerobes may be studied in this medium. Variations of the salt content might prove advantageous in case of certain species."

J. D. T.

SOPARKAR (M. B.). **The Nutritional Values of Heated Blood Agar.**—*Indian Jl. Med. Res.* 1923. Oct. Vol. 11. No. 2. pp. 421–428. [8 refs.]

The object of the investigation, details of which are given in this article, was " to determine the effect of varying degrees of temperature upon the nutritive qualities of blood when added to a plain medium for the cultivation of the haemophilic organisms."

The conclusions arrived at are :—

"Under the conditions of experimentation it may be concluded that :—

"1. Unheated blood affords a poorer growth of *B. influenzae* than heated blood.

"2. The growth-promoting quality of heated blood is gradually developed as the temperature used in heating rises.

"3. The maximum development of this growth-promoting quality in the case of *B. influenzae* takes place for a temperature of 67° to 70° C. applied for 10 to 15 minutes.

"4. Heating the blood used in the medium at temperatures beyond the optimum leads to a gradual destruction of this quality.

"5. The luxuriance of growth of *B. influenzae* upon heated blood media depends, within certain limlts, upon the concentration of blood in the medium."

J. D. T.

i. NAND LAL. **The Re-Use of Media. Part II.**—*Indian Jl. Med. Res.* 1923. Oct. Vol. 11. No. 2. pp. 441–443. [6 refs.]

ii. —— **The Effect of Direct Sunlight on Sealed Cultures of Organisms.** —*Ibid.* pp. 445–447. [1 ref.]

i. The trials were confined to the use of trypsin and a 4 per cent. peptone solution. The results are tabulated and the conclusion arrived at is that "the addition of trypsin to a used medium restores to a large extent its nutrient character." In the discussion which precedes the conclusion it is suggested that the trypsin here acts more as a pancreatic extract supplying growth-promoting accessory substances than as a ferment.

ii. Conclusions. "Under the conditions of test here set out I may conclude that :—

"1. Exposure to direct sunlight is lethal to organisms contained in sealed tubes, but this may be due to the sterilising effect of the heat rays.

"2. Systematic alteration of temperature between 37° C. and room temperature was not more lethal for the test organisms than preservation in the dark at room temperature, with the exception of the Cholera Vibrio.

"3. The Cholera Vibrio showed itself much more susceptible to the conditions imposed than the other organisms used."

J. D. T.

VARDON (A. C.). **Desiccated Nutrient Media.**—*Indian Jl. Med. Res.* 1923. Oct. Vol. 11. No. 2. pp. 429–432. [1 ref.]

HARVEY (W. F.) in a paper entitled "Large Scale Production of Vaccine" [see this *Bulletin*, Vol. 20, p. 593] refers to casein which can be stored in the form of coarse powder for the preparation of peptone media, and to an agar powder which can be stored without deterioration and when required has merely to be weighed out and added to nutrient bouillon to make a solid medium.

The object of the experiments carried out by the author of the present article was to show that :—

"(1) Simple nutrient medium could be reduced to a dried condition without altering its nutritive value. (2) Various ingredients, such as sugar, serum, inhibitory dyes, etc., could be incorporated with simple nutrient medium to give special media, and dried without altering their special properties. (3) Economic production on a large scale was possible. (4) The dried medium could be made ready for use with a minimum of time and trouble."

Though a number of media were experimented with the author confines his detailed descriptions "to the preparation and reproduction of simple nutrient agar, simple bouillon, and as examples of special media to the preparation of Loeffler's and Aronson's media."

J. D. T.

BERNARD (P. Noël). **Sur un mode de préparation du vaccin antistaphylococcique.**—*Bull. Soc. Path. Exot.* 1923. June 13. Vol. 16. No. 6. pp. 390–392. [1 ref.]

After referring to the frequency, severity, and debilitating effects of furunculosis in tropical climates, the author describes the preparation of a stock vaccine which he recommends for the treatment of this malady.

A goodsized unbroken boil, with well-marked peripheral reaction, is chosen, and the skin over it is disinfected with tincture of iodine. A drop of pus is drawn by means of a pipette and is transferred from the boil to the water of condensation in an agar tube. A little of the dilution is then transferred on the point of a platinum wire to the water of condensation in a second tube. The two tubes are now inclined so as to spread the water of condensation over the surfaces of the agar. From the second tube 4 to 7 well-isolated colonies should be obtained, each of which after 24 hours' incubation at 37° C. may attain to a diameter of 5 mm. These colonies are verified and the water of condensation of a Roux bottle of agar is inoculated from one of them. After 20 hours' incubation an abundant growth is obtained. 50 cc. of normal saline are added and the growth is removed from the surface of the agar and mixed with the saline. The mixture is then centrifuged, washed 3 times by centrifugation and the final deposit diluted with 50 cc. of pure glycerine (30° Baume), sterilized and placed on ice or in cold chamber at about 4° C. All the germs in the dilution are dead in the course of 1 to 3 months. The vaccine is prepared from the mixed contents of 8 flagons containing the dead cultures of 8 different strains of staphylococci (or of staphylococci derived from 8 different sources). 600 cc. of normal saline are added to each 50 cc. of pure glycerine containing the washed growth of one Roux bottle. The dilution thus obtained contains about 6,000 millions of staphylococci to the cc. Lastly the vaccine is put up in ampoules for use.

The vaccine is given daily, ½ to 1 cc. on the first day, 1 cc. on the second and on following days. For adults the dose may be raised to 2 or 3 cc. per day, and for infants it is diminished in proportion to age. The contraindications are the same as for other bacterial vaccines.

As the result of treatment usually in about 12 hours after the 2nd injection (*i.e.* about 36 hours after the commencement of treatment) a distinct amelioration has set in. The painful tension abates. In 2 or 3 days later the boils that were forming are drying up, while those fully formed, if they do not recede, quickly ripen and discharge their contents. The treatment is continued for 6 days at least, and in exceptional cases much longer. Any boils that have reached the stage of suppuration should be evacuated at the beginning of the treatment.

From observation of many hundreds of cases the author is convinced that the value of autovaccines depends less on the strains used having been derived from the case treated, than on the mode of preparation and on the directness of the transfer. A vaccine prepared from staphylococci that have been grown only once on an artificial medium and killed by glycerine as described above is more active than one where the staphylococci have been killed by heat at 68° to 72° C., or than one killed by glycerine but from staphylococci that have been sub-cultured several times on artificial media, or after undergoing a passage through a rabbit.

J. D. T.

i. HARVEY (W. F.) & IYENGAR (K. R. K.). **The Development of Protection after Prophylactic Inoculation.**—*Indian Jl. Med. Res.* 1923. Apr. Vol. 10. No. 4. pp. 990–995. [9 refs.].
ii. —— & —— **The Duration of Protection after Prophylactic Inoculation.**—*Ibid.* pp. 1147–1149. [1 ref.]
iii. —— & —— **The Influence of Age and Temperature on Bacterial Vaccines. Part III.**—*Ibid.* July. Vol. 11. No. 1. pp. 110–112. [1 ref.].
iv. —— & —— **On the Relation between Size of Prophylactic Dose and Protection.**—*Ibid.* pp. 113–118. [11 refs.]
v. —— & —— **On Immunization with relatively Avirulent Living Organisms.**—*Ibid.* Oct. Vol 11. No. 2. pp. 433–436. [5 refs.]
vi. —— & —— **Immunization by Re-Inoculation, after a Long Interval, with a Diminished Dose of Vaccine.**—*Ibid.* pp. 437-440. [3 refs.]

i. As in most of their work on immunity problems the organism employed was *B. avisepticus*, the experimental animal the pigeon, the inoculations (both prophylactic and test) were intravenous, and the doses used are given in weights of the dry organism as determined by Brown's opacity tubes. A table is given showing the results of testing 220 pigeons. These results are discussed, and the particular conclusions arrived at are that: —

"1. No evidence of protection is manifest 7 days after with a single dose of prophylactic antigen.

"2. Development of immunity is significantly manifest very quickly after the administration of a second dose of prophylactic antigen.

"3. Development of immunity reaches its maximum about the 14th day after the administration of a second dose of prophylactic antigen and remains at its maximum up to at least the 30th day.

"4. The curves showing rise, maximum, maintenance and fall must be of very different type for agglutinin production and immunity production."

ii. In their experiments to determine the duration of protection the conditions of testing were identical with those for development, but were carried on to the point of time at which degree of immunity falls to zero or nearly zero. The results of testing 80 pigeons are given in tabular form. Their particular conclusions are that: —

"(1) Evidence of a high degree of protection is manifest for 3 months after inoculation of antigen.

"(2) Evidence of almost complete loss of protection is manifest 5 months after inoculation of antigen."

iii. In Part II of this series [see this *Bulletin*, Vol. 19, p. 781] the authors concluded that "a fowl cholera vaccine does not deteriorate in antigenic potency with age or with subjection to the action of any temperature to which it is likely to be exposed within 6 or 9 months from date of preparation." The present investigation (Part III) was carried out to ascertain if the same holds with alterations of temperature. From their experiments which were carried out on the same general lines as before the authors conclude that:—

"1. A 'fowl cholera' vaccine does not deteriorate in antigenic potency when subjected, 24 hours at a time for a month, to the varying temperatures of 37° C. and about 18° C.

"2. It may be opined that 'fowl cholera' vaccine will not deteriorate in antigenic potency with age or with subjection to the action of varying temperatures to which it is likely to be exposed within the period when it may be expected to be used.

"3. What applies to 'fowl cholera' vaccine may apply to some other vaccines also."

iv. The organisms used and the methods employed being the same as in other investigations belonging to this series the authors conclude as a result of their investigation that :—

"1. A dose of prophylactic vaccine composed of dead organisms may prove undesirably toxic, as demonstrated by the occurrence of deaths among trial animals during the course of immunization.

"2. It is very desirable to determine as exactly as may be what is the optimum size of dose to produce maximum protection.

"3. According to the size of prophylactic dose there is produced an insufficient or a sufficient protection and the insufficient protection is exhibited with both too small and too large a prophylactic dosage.

"4. It is undesirable to overstep in either a minus or a plus sense the limits of prophylactic vaccine dosage capable of producing maximum protection.

"5. The rise of agglutinin content of the serum as a result of administration of prophylactic antigen does not correspond with the rise and fall of protection.

"6. What applies to fowl cholera vaccine may apply to some other vaccines also."

v. "With such an organism as has been used by us and with the methods employed we may conclude that :—

"1. No difference of effect exists as between a prophylactic vaccine of living, relatively avirulent organisms and a vaccine of dead virulent organisms.

"2. Agglutination titre does not correspond to protection.

"3. What applies to fowl cholera vaccine may apply to some other vaccines also."

vi. "With such an organism as has been used by us, and with the methods employed we may conclude that :—

"1. Complete immunization of animals can be effected with doses of antigen very much smaller than the lowest optimum prophylactic dose originally administered, and that, after they have apparently lost the immunity originally conferred.

"2. What applies to fowl cholera vaccine administered intravenously, may apply to other vaccines also and to their subcutaneous inoculation."

J. D. T.

WESTERN (G. T.) & BARNARD (J. E.). [Revised by.] **Methods for the Detection of** *Spironema pallidum.—Med. Res. Council. Privy Council. Special Report Series No.* 19 (Revised). pp. 27–48. With 3 plates & 11 figs. [2 refs.]

The importance of detecting the Spironema at the earliest stage of the primary infection cannot be overestimated. The present report embraces :—

I. *Collection of Material.*—Under this heading directions are given for collecting material from (*a*) superficial lesions, (*b*) lesions of the mouth, (*c*) skin lesions, and (*d*) lymph glands. In each case the object aimed at is to obtain fluid freshly expressed from the tissues of the lesion, free from contamination and from admixture of blood.

II. *Demonstration of the spirochaetes.*—1. Dark-ground Illumination.—This, the ideal method for demonstrating *S. pallidum,* is dealt with by J. E. Barnard in a comprehensive manner under the headings "The Microscope," "Objectives," "Oculars," "Cover-glasses and Slides," "The Dark-Ground Illuminator, ' " Illuminants." " Manipulation " and " Method employed for differentiating between *S. pallidum* and other Spironemata." Three plates illustrate spirochaetes demonstrated by dark ground illumination and show the main points by which *S. pallidum* can be distinguished from other spirochaetes. The relation which the number of spirals bears to a given length is a useful aid to diagnosis. *S. pallidum* should have seven complete coils to the width of a normal red blood corpuscle (*i.e.* to 7·5 μ). To facilitate comparison an eye-piece scale has been devised which in effect introduces a number of artificial corpuscles into the field of view. The apparatus, which is described and illustrated, can be obtained from Messrs. Hawksley & Sons.

2. Stained Films.—In this section Clifford DOBELL referring to the staining properties of *S. pallidum* writes, " The difficulty of staining this organism is so characteristic of it that it may be laid down as a general rule that when spirochaetes are visible in preparations stained by such methods [*i.e.* by the simple aniline dyes commonly employed in bacteriology] then they certainly do not belong to this species."

"Giemsa" is specially recommended as being the most serviceable of the modifications of Romanowsky (" by far the simplest and most convenient stain for demonstrating *S. pallidum* in smears") and useful practical instructions for its employment are given of which the following is a résumé :—

Strict attention must be paid to every detail in the process ; slides used in the making of the films must be specially cleaned ; the films must be spread thinly and evenly (if necessary the material to be examined may be diluted to a suitable consistency with physiological saline solution) ; allow the films to dry in air, or still better place them in a desiccator (never employ heat, and avoid dust particles) ; when dry immerse the films for 5 to 10 minutes in absolute alcohol (pure ethyl or methyl alcohol) and transfer them to distilled water before applying the stain ; use neutral distilled water with which to mix the staining solution. The following simple way *to adjust the distilled water to the right reaction* is copied verbatim. " Measure the amount of water required (say 5 c.cm. for staining two or three films) into a clean test-tube. With a glass rod add a very small drop of neutral red solution (1 per cent. in distilled water), and stir. The water will turn pink (acid). Now add, with the glass rod, a trace (not a drop) of 1 per cent. aqueous sodium carbonate solution, and stir again. If the solution turns a pinkish yellow it is now neutral ; if it remains pink it is still acid, and a further trace of carbonate must be added, and the process repeated till the right colour is obtained ; if it turns yellow, it has become alkaline, and too much carbonate has been added. (In this last case it is best to discard it, and begin again.) The colour to be aimed at is one between red and yellow, and with a little practice it can usually be hit off in a few seconds. When the water shows the right reaction, as thus determined by its colour, it is ready for use. *Add the stain to this water*—containing the neutral red—dropping in one drop of stain for every cubic centimetre of water in the test-tube. (The small amount of neutral red in no way interferes with the working of the stain.) Do not add *more* than this amount of stain to the water—in the erroneous belief that a stronger solution will be a more potent stain. Mix the solution by *stirring* carefully with the glass rod. *Never shake* the solution, nor squirt it in and out of a fine pipette, as this precipitates the stain and may ruin the solution completely. The solution is now ready for use, and in this dilute state will not keep. It must be used *at once*."

Cover the whole surface of the slide with the diluted stain, pouring it from the test-tube on to the films and using an excess of solution for each film ; stain for 3 to 6 hours ; always *flush* the stain off the slide with a strong jet of water ; wash for a few minutes longer, then rinse in distilled water and allow to dry (or after wiping the back and edges of the slide dry place it in a desiccator until quite dry).

The Indian Ink and Congo Red methods, though very useful for demonstrating other Spirochaetes, are not recommended for the detection of *S. pallidum*. The Silver Nitrate methods are also described [see also this *Bulletin*, Vol. 20, p. 591].

Advantages and Disadvantages of Staining Methods for demonstrating *S. pallidum.*—Where the results are positive, well-stained preparations afford characteristic appearances and cannot be questioned. On the other hand, *S. pallidum* has a notable lack of affinity for most staining reagents, and an erroneous idea of their frequency and numbers may be formed as many may remain unstained. So also distortion caused by drying and absence of characteristic movement are distinct disadvantages.

III. *Soft Chancre and Balanitis.* Referring to soft chancre and balanitis the authors conclude that there is not sufficient evidence of their being specific diseases due to a single species of micro-organism, but that the diagnosis, which should be founded on clinical evidence, should not be given until syphilis has been excluded by observations extending over a period of 12 weeks.

Appendix II. On the Nomenclature of the Spirochaete of Syphilis. By Clifford DOBELL.

The author by a critical examination of the subject in strict accordance with the laws of nomenclature makes it clear that the correct name of the Spirochaete of syphilis is in full *Spironema pallidum* (SCHAUDINN, 1905), VUILLEMIN, 1905 ; or more briefly *Spironema pallidum* Schaudinn.

J. D. T.

WESTERN (G. T.). [Revised by.] **The Laboratory Diagnosis of Gonococcal Infection.**—*Med. Res. Council. Privy Council. Special Report Series No.* 19 (Revised). pp. 5-26. With 2 plates. [22 refs.]

In the introductory paragraphs attention is called to the difficulties associated with the diagnosis of gonococcal infection ; and the adoption of some routine bacteriological technique whereby the chances of incorrect diagnosis may be reduced to a minimum is recommended. It is pointed out that, though a *positive* diagnosis is justified from expert microscopic examination of the films prepared and stained by the proper technique, a *negative* diagnosis requires that the negative findings of such an examination be confirmed by cultural and other methods. Systemic infection may have occurred, and may persist long after the gonococci have apparently been eliminated from the primary focus or foci of infection, and for this order of cases indirect methods of investigation such as complement fixation may be required before a negative diagnosis may be given.

The subject is then treated under five separate headings.

I. *The localities to be examined for the presence of Gonococci.* Only chronic cases and those in which there is little or no secretion present difficulty in this connexion. The sites where gonococci may persist for long periods and the routine procedure in the examination both of the male and of the female suspect are given ; and it is pointed out that the procedure, however thorough, is of absolute diagnostic value only when a positive result is obtained, although repeated and consistently negative results by experienced workers are not without value.

II. *Methods to be employed for the identification of the Gonococcus in Film preparations.*

Here again the difficulty is with chronic cases with little or no discharge, particularly in the female, where it is not usual to find typical swollen pus cells packed with bean shaped diplococci such as are characteristic of the acute and subacute disease, and where the diagnosis must be made on extracellular pairs or groups of cocci.

The gonococcus is Gram-negative, while the majority of micro-organisms which may be confused with it are Gram-positive. The films should therefore be stained by Gram's method or some modification of the same. Jensen's modification which gives excellent and consistent results is recommended to the exclusion of the original Gram's method.

" Briefly, Jensen (1) discards the aniline water, (2) increases the concentration of the iodine solution, and (3) counterstains by neutral red.

" The exact technique of Jensen's method may be described as follows:—

" 1. Make a thin film. If the film be thick or irregular in its thickness, uniform decolorisation becomes impossible and Gram-negative organisms may in parts retain the stain.

" 2. Fix in the flame, taking care to avoid overheating. If this be accomplished too rapidly, and the film be subjected to too great a heat, ambiguous results are obtained.

" 3. *Let the preparation become cool.*

" 4. Stain with a 0 5 per cent. aqueous solution of methyl violet (6 B.) for one quarter to half a minute.[1]

" 5. Pour off the mass of methyl violet solution and wash away the remainder with a drop or two of *strong* Lugol's solution (iodine 1 part, potassium iodide 2 parts, distilled water 100 parts). Do not wash off with water.

" 6. Pour on a fresh quantity of strong Lugol's solution and leave for one half to one minute.

" 7. Wash off the iodine with *absolute* alcohol. This *must* be absolute, *i.e.*, 98 per cent or over. Weak alcohol tends to decolorise Gram-positive organisms.

" 8. Pour on fresh absolute alcohol (98 per cent.), rocking the slide from side to side as in developing a photograph. A third quantum of absolute alcohol may be required to complete the decolorisation. There is gradual decolorisation with absolute alcohol, but only after a length of treatment that is not employed in ordinary routine. It should never be used for more than two minutes.

" 9. Finally rinse with a few drops of absolute alcohol, followed immediately, without any intervening washing in water, by a solution of neutral red.[2] Let this act for fifteen seconds to one minute. Gram-positive

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[1]. This solution remains stable for months. A convenient way of applying this is to cut a strip of filter-paper to cover the slide. The stain is then poured on to the filter-paper and allowed to stand for 15–30 seconds. It is then poured off and the iodine poured on. The filter-paper may then be stripped off and some fresh iodine poured on. This method avoids any deposit forming on the film.

[2]. Make up the solution in the proportion of :—

Neutral red	1 gm.
Distilled water	1,000 c. cm.
1 per cent. glacial acetic acid	2 c. cm.

If this be found too weak, a somewhat stronger solution of neutral red may be employed, organisms which successfully resist exposure to absolute alcohol for two minutes may be decolorised, the gentian violet being masked—(*a*) if the counterstain be in too concentrated a solution, (*b*) if it be made up in a weak alcoholic solution, or (*c*) if when properly prepared its action be prolonged. As a result Gram-positive organisms may appear to be Gram-negative.

" 10. Wash in distilled water; dry with blotting-paper and in air, and mount in the usual way.

" To test the individual technique it is recommended that there be kept at hand pure cultures of a known Gram-positive organism, such as the *Micrococcus* (*Staphylococcus*) *aureus*, and of a Gram-negative organism (*e.g.*, *B. coli*), and that parallel films of the two be made and stained side by side with the material under examination.

" *On the limitations of Gram's method in relationship to the diagnosis of gonorrhoea.*

" It deserves note that Gram-positive organisms when taken up and partly digested by leucocytes often lose their Gram-positive character.

" We are of opinion that this limitation does not effect the diagnosis in acute cases, and that in chronic cases the figures provided reduce the danger of confusion with other actual or apparent Gram negative organisms to a minimum."

III. *The Cultivation of the Gonococcus.*

The various media which have been devised are referred to under four categories. It is pointed out that " in the preparation of all these media careful attention to detail in the preparation of the nutrient agar, which is their base, is of great importance." Details for the preparation of some of the media are given in an Appendix (Appendix I).

" For differentiating the gonococcus from other Gram-negative diplococci in culture it should be grown on media containing 1 per cent. of glucose, maltose, and saccharose respectively, with the addition of litmus. The gonococcus produces acid with glucose only."

IV. *Methods for the Production of a Focal Gonococcal Reaction.*

Inoculation or vaccination with a suitable dose of a suspension of dead gonococci is the most direct and most effective method of producing a focal reaction. In metastatic infection the reaction is manifested by increased pain in, or tenderness of, the affected part. In either case there may be a definite rise in temperature with or without malaise. Caution is necessary. There is danger of lighting up a latent iritis or salpingitis, with serious results.

In cases of doubtful urethritis an alternative method is the introduction of a 0·5 per cent. solution of silver nitrate into the urethra.

V. *The Complement Fixation Test.*

After a general review of the development of this test modified by the employment of a polyvalent antigen or of an antigen consisting of a strain selected as having markedly generalized antigenic affinities, its advantages, disadvantages, and limitations are considered.

The conclusion come to is that " while it cannot replace other methods of diagnosis the complement fixation test may, in certain cases, be the only laboratory means by which a gonococcal infection may be diagnosed. It is most likely to be of value in cases of metastatic infection where direct demonstration of the gonococcus may be difficult, if not impossible, and it is in these that the highest proportion of positive results is obtained."

The author of this report cannot at present recommend any one standard method of complement fixation, but he appends the methods of four careful observers, and recommends that in tests made for official returns the method of complement fixation employed be clearly stated.

J. D. T.

i. MALONE (R. H.). **On Certain Fallacies associated with the Use of Laboratory Animals for isolating Pathogenic Micro-Organisms.** *Indian Jl. Med. Res.* 1923. Apr. Vol. 10. No. 4. pp. 1123–1126.

ii. ——. **A Method of estimating the Degree of Solubility of Micro-Organisms in Bile and "Bile Salt" Solutions.**—*Ibid.* pp. 1144–1146. [2 refs.]

i. When living organisms have been injected into an animal and that animal subsequently dies of general septicaemia the micro-organism to which the septicaemia is due is not necessarily the micro-organism that was inoculated. This is well recognised when the two micro-organisms are totally unrelated, but when they happen to be members of the same or closely related species, only differing from one another in one or more characters, it has, the author thinks, been too readily assumed (especially by investigations of the streptococcus-pneumococcus group) that these slighter differences in character result from a "mutation" or the acquirement of new properties due to animal passage.

Under the heading "The inoculation of a 'bile insoluble' diplococcus intraperitoneally into a young rabbit with the recovery, post-mortem, of a 'bile soluble' strain" the author relates two cases of so-called "mutation" among the capsulated diplococci, both of which he thinks "may be explained without accusing the organisms of behaving in an unorthodox manner." After giving full particulars of Case 1, he shows that though the original culture was obtained from what was considered to be a single colony, yet, when plated out, naked eye inspection of the culture plates showed two distinct types of colony, and when these were subcultured one proved to be "bile insoluble" and the other "bile soluble." The two strains were also distinct as regards their 'serological type.' He concludes that "But for the obvious difference in the appearance of the colonies (*a*) and (*b*) when culture L 38 [the original culture] was plated out, the presence of two distinct strains would have passed unnoticed, and the change from bile insolubility to bile solubility might have been recorded as evidence of 'mutation.'" In case 2, also fully related, two explanationsa re offered:

"(1) J 32 [the original culture] may have consisted of two strains growing in symbiosis. The bile insoluble strain, being less virulent than the soluble strain, disappeared in the animal body while the bile soluble and more virulent strain alone survived.

"(2) The organism (J.32^1) recovered from the rabbit may have been an entirely different strain from that injected (J 32). The points in favour of this view are (1) the colonies of J.32 were quite different in appearance from those of J.32^1; (2) the extremely low virulence of the original strain J.32 necessitated very large doses of living organisms in the animal passages, thus favouring an intercurrent infection."

ii. The method here described, though applicable to whole bile or any of the bile salts upon other groups of organisms, refers particularly to the action of sodium taurocholate on the members of the pneumococcus-streptococcus group. "The principle of the method is that underlying the use of opacity tubes for the standardisation of vaccines;

namely, that the opacity of a given bacterial suspension is directly proportional to the weight of the bacteria per unit volume of that suspension."

Details of the method and of the requisites for carrying it out are given.

J. D. T.

FREUND (Jules). **New Method for Increasing Yield of Therapeutic and Diagnostic Serum.**—*Jl. Infect. Dis.* 1923. Oct. Vol. 33. No. 4. pp. 328–330.

By the method here described the red cells of the freshly drawn blood are first removed, and the haemoglobin-free plasma allowed to clot. The clot is then subjected to pressure to yield the maximum of serum.

Plasma free from haemoglobin may be obtained either by (1) the addition of chemicals, such as sodium citrate and oxalate, to the freshly drawn blood, or by (2) cooling the blood and maintaining it at a low temperature—the plasma in either case being syphoned off after the cells have settled and before clotting begins.

The technique recommended is as follows :—

" Forty cc. of a 25 per cent. solution of sodium citrate is put in a jar and 3,000 cc. of blood drawn in the same receptacle, the mixture allowed to stand for 12 to 24 hours, preferably at room temperature, because the blood cells separate more quickly at room than at icebox temperature. The plasma is then drawn off into a second jar containing 20 cc. of a 25 per cent. solution of calcium chloride. The clot is formed in 30 to 40 minutes. Three or four hours later the clot is cut in 4 or 5 places and the proper weight, to be described, placed thereon. The serum which is squeezed out is drawn off the following day.

" The second method prevents clotting by means of cooling : the blood is drawn into a jar and placed in ice water of a temperature from 0 to 1 C. (not higher) for 24 hours. The plasma is syphoned into a second jar and allowed to clot at room temperature, 30 to 40 minutes being sufficient. The remainder of the procedure is carried out as described for the citrated blood method.

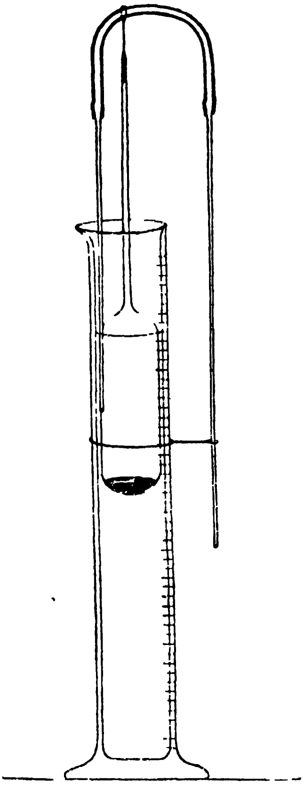
" In both methods, the size of the jar for collecting the blood is 55 by 15 cm. ; for squeezing out the serum, 22 by 18 cm. ; and a weight of 15 pounds is used. The weight was prepared as follows :—Melted paraffin was poured into the jar and strings placed in it while it was liquid. After the paraffin solidified the jar was put in a water bath and heated until the paraffin began to melt. When the outside began to soften the paraffin block was taken out. In order to obtain a negative mold for the weight a plaster paris form was cast. It was found practical in making the form to use 5 per cent. acetic acid instead of water. After removing the paraffin, 15 to 16 pounds of lead were poured into the form, and copper wire to serve as a handle was fixed in the lead before solidification. The weight was then copper plated."

It is claimed for this method that, compared with the method in which withdrawals of serum are made over a period of 8 days, from 10 to 95 per cent. greater yield of serum free from haemoglobin may be obtained—the variation depending on whether the animal has been bled before or not, the larger increase being obtained from animals that have been bled but once.

J. D. T.

TAYLOR (J.). **A Note on a Simple Apparatus for obtaining a Constant Drop Flow of Saline Solution.**—*Indian Jl. Med. Res.* 1923. Oct. Vol. II. No. 2. pp. 639-641. With 1 fig. [1 ref.]

The apparatus described and illustrated is a modification of DREYER & WARD'S (*Lancet*, 1921, May 7th), and may be easily made from materials available in most laboratories. It is suitable for workers doing small numbers of tests.



Apparatus for obtaining constant drop flow of saline solution. [TAYLOR (J.).]
[Reproduced from the *Indian Journal of Medical Research.*]

Materials required are a 100 cc. cylindrical measure-glass; a 25 cc. Maynard's pipette (as used for bottling vaccines), with a little mercury to convert it into a float with the bulb about four-fifths submerged; a piece of platinum wire about 2 inches long; 2½ inches of stiff rubber tubing of ⅛ inch diameter; and suitable glass tubing to be drawn out into capillary tubes of suitable length and diameter. The cylindrical measure-glass is selected so that its bore will allow sufficient room for the Maynard pipette together with a capillary tube to move freely up and down. The illustration (here reproduced) shows the apparatus assembled. The platinum wire is shown twisted to form a loop in its centre of such a size as to grasp firmly (without constricting) the rubber tubing, and is fused into the stem of the pipette, which is sealed at the same time. The capillary tube inside the cylindrical measure-glass is cut to such a length as to come an inch or two below the surface of the fluid when the float is in position; and, for outside, one is selected of such a length and diameter as is found experimentally to give the rate and size of drop required. The apparatus may be sterilized with all parts in position.

J. D. T.

LEÃO (Antonio Eugenio De Arêa). **Do Diagnostico das Trypanosomoses pela reacção do Desvio do Complemento.** [Fixation of Complement in Trypanosomiasis.]—*Sciencia Med.* Rio de Janeiro. 1923. Sept. 30. Vol. I. No. 3. pp. 126–134. [12 refs.]

The author describes the material used by him as antigens for this test. Three are prepared from the organs of infected animals and two from the blood. For the former an aqueous, a glycerinated, or an alcoholic extract is made from the spleen, the heart, the liver, or the bone-marrow.

For obtaining the aqueous extract the organ is finely divided and triturated in a mortar; 1 per cent. phenol in distilled water is then added in the proportion of three parts to one of the tissue. The whole is left at room temperature, with daily shaking, for 15–20 days, then filtered and made isotonic by addition of sodium chloride.

For the glycerine extract, glycerine, two parts, is added to one of the tissue for trituration and the mixture is left at room temperature for two or three days, being frequently shaken during this period. It is then filtered and treated with absolute alcohol. The dense precipitate which forms is filtered off, collected and washed with absolute alcohol. The dried residue is emulsified in phenol-saline. It soon deteriorates and is better kept as a powder. For use the powder is triturated with phenol-saline (0·5 per cent. phenol), 1 gm. of the powder to 100 cc. The product is filtered through cotton wool; the resulting opalescent emulsion constitutes the antigen.

The alcoholic extract is prepared in a similar way, using alcohol in place of the water or glycerine. This is not so good an antigen as the others.

Antigens prepared from the circulating blood of infected animals are much more active and reliable. They may be obtained either from haemolysed or non-haemolysed blood. The reaction being a group and not a specific one in the narrow sense, the potency of the antigen depends on the number rather than on the nature of the trypanosomes.

A rat is inoculated intraperitoneally with *T. equiperdum*, 0·1 cc. of a solution containing 10 trypanosomes per field. This would usually prove fatal in 4 days, so the animal is bled on the third day, the blood being collected in citrate-saline, filtered through gauze and centrifuged at high speed for 20–60 minutes. To the deposit which contains the corpuscles and trypanosomes distilled water is added in sufficient quantity to produce haemolysis; the product is again centrifuged. The supernatant fluid is removed and the deposit washed two or three times with normal saline. To this deposit of trypanosomes and corpuscle stroma is added three times its volume of glycerine and normal saline in equal parts. The resulting emulsion is kept at low temperature in the dark. For use, it is diluted 1 in 15 with saline.

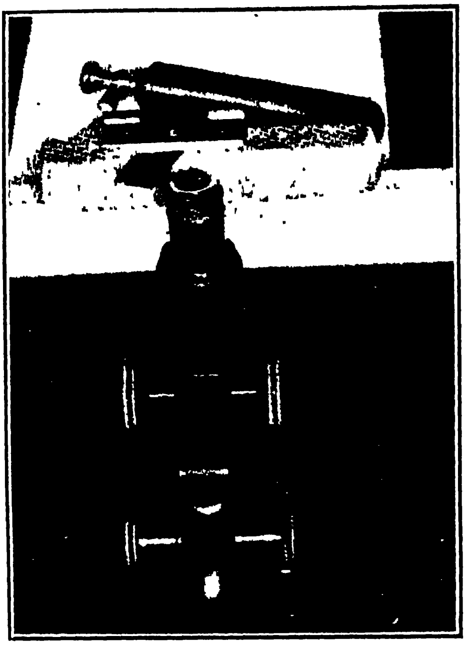
H. Harold Scott.

JOURNAL OF LABORATORY AND CLINICAL MEDICINE. 1923. June. Vol. 8. No. 9. (i) **An Emergency Microtome.** [GLAISTER (Arthur H.).] p. 611. With 1 fig. (ii) **The Estimation of Albumin in Urine.** [QUICK (Armand J.).] pp. 615–618. With 1 chart. [3 refs.]

IBID. Oct. Vol. 9. No. 1 (iii) **A Method of Preparing Uniform Stains.** [COLLINS (C. Creston).] pp. 63–64.

i. In the absence of a microtome, passable sections can be made in the following manner:—

"Place the microscope beside a steady shelf of suitable height, remove the eye piece and fit the draw tube with a cork having a coin cemented on top with sealing wax.



An emergency microtome contrived from a microscope and a safety-razor blade.
[GLAISTER (Arthur H.).]
[Reproduced from the *Journal of Laboratory and Clinical Medicine.*]

" For the knife use a safety-razor blade clamped in a folded hinge which is secured to a block of fairly hard wood with wood screws.

" Freeze the tissue on the coin with a spray of ethyl chloride, and cut by sliding the knife block along a piece of glass secured to the edge of the shelf, adjusting the tissue to the knife with the coarse focus and feeding the desired thickness between cuts with the fine focus."

ii. In this communication it is pointed out that the greatest source of error in estimating albumin in urine by Esbach's method (the results of which are often not even roughly quantitative) lies in the tube itself. The original tube, empirically calibrated, "has been copied and recopied with ever accompanying errors so that now a variety of tubes are found on the market which vary greatly in shape and dimensions." The method, moreover, takes little account of such factors as temperature and the specific gravity of the urine. Experiments were made with three protein precipitating agents and with urines containing known amounts of egg albumen. The effects of temperature and of specific gravity of the urine were also studied. The article concludes with the following summary :—

" 1. A comparative study of the modifications of the Esbach method for the determination of protein in urine has been made. Since the available Esbach tubes were unsatisfactory, a new tube was designed and described. Esbach's reagent, Tsuchiya's reagent, and a 10 per cent. trichloracetic acid were studied as precipitating agents. The influence of temperature and of specific gravity of urine were determined.

"2. A 10 per cent. solution of trichoracetic acid as a precipitating reagent was shown to yield the most satisfactory results."

iii. Besides observing the usual precautions to obtain good dyes and chemically pure absolute methyl alcohol (free from acetone) for the preparation of Romanowsky stains, "the mixture should be placed in an amber bottle, stoppered with a greased glass stopper, shaken for twenty minutes each day for ten consecutive days, and allowed to stand for five days more before using. . . . This is a minimum time for the obtaining of uniformly perfect results."

J. D. T.

i. HARVEY (W. F.). **Bacteriological and Laboratory Technique. Section IX. Pathogenic Material Examination.**—*Indian Jl. Med. Res.* 1923. Apr. Vol. 10. No. 4. pp. 1078–1116.

ii. —— **Bacteriological and Laboratory Technique. Section X. Pathogenic Material Examination.**—*Ibid.* 1923. July. Vol. II. No. 1. pp. 119–176.

i. The ninth instalment deals with the examination of pathogenic material, the particular items being numbered from P4 to P4.572. As with former sections, an alphabetically arranged index is appended.

ii. The tenth instalment deals with pathogenic material, the particular items being numbered from P4 to P5.38. It begins with an Introduction acknowledging indebtedness to the works of various authors, to the publications of the Medical Research Council, to the Reports ot U.S.A. Health Service, and to the Final Report of the Committee of the Society of American Bacteriologists on Characterisation and Classification of Bacterial Types. The list of abbreviated terminology for genera of organisms given in Sections I and IX is added to in this section ; and the section ends, as other sections have done, with an alphabetically arranged index.

J. D. T.

HERRERA (A. L.). **Sur l'imitation des plasmodies et des structures chromatiques avec le silicate de sodium noirci par le noir d'ivoire et des gouttes d'alcool en diffusion.**—*C. R. Acad. Sci.* Paris. 1923. Apr. 9. Vol. 176. No. 15. pp. 1011–1012.

ROSENBERGER (Georg). **Ueber die Technik der Herstellung des Schutzimpfstoffes gegen Fleckfieber nach Rocha-Lima in der Modifikation und Praktik von Weigl.**—*Arch. f. Schiffs- u. Trop.-Hyg.* 1922. Vol. 26. No. 5. pp 129–140. With 4 text figs.

VAN DEN BRANDEN (F.). **Fonctionnement du laboratoire de Léopoldville durant l'année 1920.**—*Ann. Soc. Belge de Méd. Trop.* Brussels. 1921. Dec. Vol. 1. No. 3. pp. 271–274.

MEDICAL ZOOLOGY.

LINS (Abdon Eloy Estellita). **Protozoarios e Protozooses.**—*Arch. Brasileiros de Med.* 1923. Apr., May, Aug., & Sept. Vol. 13. Nos. 4, 5, 8 & 9. pp. 381-409; 534–553; 802–822; 881–909. With 15 text figs. [3 refs.]

These papers appear to form a useful handbook of intentionally limited scope. After describing various well approved processes and methods of laboratory manipulation, and surveying the Protozoa and their several subordinate groups in their structure, natural history, and classification, the author deals individually with the pathogenic Protozoa and several by corresponding protozoan diseases occurring in Brazil.

A. Alcock.

PINTO (Cesar). **Transmissão dos Protozoarios.**—*Sciencia Medica.* Rio de Janeiro. 1923. July 31. Vol. 1. No. 1. pp. 17–36. With 1 fig.

This paper is in catalogue form and consequently does not permit of condensation. It comprises a history, with brief notes, of the subject of the transmission of protozoal parasites of man and some animals. The information in tabular form at the end of the paper will prove very useful, but the notes which precede them are not sufficiently detailed to serve as more than references.

The tables referred to deal with the following points:—1. The various protozoa, with their intermediate hosts and the names of the authorities who have investigated them; 2 A list of the Reduviid bugs and other insects which transmit the *Schizotrypanum cruzi*; 3. The geographical distribution of Brazilian blood-sucking Reduviidae; 4. A list of the Anophelinae which have been shown, experimentally or in nature, to transmit malaria; 5. The geographical distribution of Brazilian Anophelinae.

H. Harold Scott.

FRANCHINI (G.). **Sur les protozoaires des plantes.**—*Ann. Inst. Pasteur.* 1923. Oct. Vol. 37. No. 10. pp. 879–885. [10 refs.]

This is to some extent a summary of a long series of papers contributed by the author during recent years to the *Bulletin de la Société de Pathologie Exotique.*

Following on the discovery by LAFONT of Leptomonas in the milky juice of Euphorbias, the author has demonstrated the existence of Leptomonads and trypanosomes in numerous species of that same genus, and has also succeeded in infecting *E. pilosa* with cultures of the Herpetomonas of the dog-flea and *E. ipecacuanha* with cultures of the kala azar parasite and in cultivating trypanosomes (including *T. cruzi*) in the juice of several other species of Euphorbia. He has also seen various protozoa in plants of other orders having a milky juice—namely flagellates and amoeba in Aselepiads, amoeba and flagellates resembling trypanosoma in *Apocynaceae,* amoeba, trypanosoma and other flagellates in *Urticaceae,* and amoeba in *Artocarpaceae, Sapotaceae, Menispermaceae,* and *Anacardiaceae,* and also in lettuce. He has also found spirochaetes in *Euphorbia peplis* and flagellates in the tissues of a sickly cabbage. In some cases he has identified the plant parasites also in the intestine of insects (Hemiptera and Muscidae) living on the plants and presumably distributing infection either by bite or by faex. The author thinks it a legitimate inference not only that these protozoa may be pathogenic to plants, but also that plants may be included among natural reservoirs of protozoa of a wider pathogenic import.

A. A.

BRUG (S. L.). **Protozoölogische Waarnemingen.** [Protozoological Observations.]—*Geneesk. Tijdschr. v. Nederl.-Indië.* 1923. Vol. 63. No. 4. pp. 620–634. With 3 plates. [20 refs.]

The observations embrace the following:—

1. Two cases in which *Enteromonas hominis* was found in faeces; it differed slightly from DE FONSECA'S original description. The author is inclined to accept DOBELL'S synonymy.

2. Multiplication stages of *Blastocystis hominis*: several individuals (10–25) were found together in a membrane accumulated round a dark stained body, as described by WENYON and O'CONNOR.

3. The postmortem examination of an old laboratory monkey (*Macacus cynomolgus*) showed the presence of *Entamoeba legeri, E. cynomolgi* n.sp. (an entamoeba morphologically identical with *E. kueneni*, and *Endolimax cynomolgi* n.sp. (morphologically identical with *End. nana*). The monkey had been fed with human faeces (containing Lamblia and Blastocystis), but it is considered very unlikely that the faeces of this patient should have contained four species of amoebae which escaped intensive and repeated examination.

4. A simple nutrient medium (agar & coli bacillus) for limax amoebae is described.

W. J. Bais.

REICHENOW (Eduard). **Ueber Darmflagellatenzüchtung und deren Anwendung zum Nachweis der Flagellaten im Stuhl.** [Diagnosis of Intestinal Flagellates by Culture of Stools.]—*Arch. f. Schiffs- u. Trop.-Hyg.* 1923. Nov. Vol. 27. No. 10. pp. 367–383. [26 refs.]

With reference to a paper by HEGNER and BECKER on the diagnosis of intestinal flagellates by culture of stools (see this *Bulletin*, Vol. 20, p. 440) the present author discourses at considerable length on his own experience of the matter. He concludes that for Trichomonas and Chilomastix culture is a useful method, being conclusively reliable for the former and confirmatory of the microscope for the latter. He goes rather needlessly out of his way to point out that the method is, at present, useless for other classes of intestinal protozoa.

A. A.

DA CUNHA (Artistides Marques) & PACHECO (Genesio). **Recherches sur les flagellés intestinaux de l'homme.**—*C. R. Soc. Biol.* 1923. Oct. 13. Vol. 89. No. 27. pp. 765–767.

Among 82 individuals examined during two years at Rio de Janeiro; chiefly children with intestinal complaints, the authors have encountered Trichomonas 19 times, Chilomastix 10 times, Giardia 10 times, Enteromonas 7 times, and Tricercomonas 3 times. For cultivation of these flagellates they have found the best media to be serum, or ascitic fluid, or cerebrospinal fluid, diluted with normal saline solution. They are convinced from observations of both forms, both in the living state and after staining, that *Enteromonas hominis* Fonseca and *Tricercomonas intestinalis* Wenyon & O'Connor are distinct species.

A. A.

LIBERT (E.) & LAVIER (G.). **Sur l'habitat de** *Giardia intestinalis* **chez l'homme. Précisions fournies par le tubage duodénal.**—*Bull. Soc. Path Exot.* 1923. Oct. 10. Vol. 16. No. 8. pp. 589–592. [10 refs.]

After some retrospective remarks on the question of the exact enterographical distribution of Giardia the authors give particulars of three cases in which this parasite was located in the duodenum by tubage operations.

A. A.

HOLLANDER (Edward), *Giardia intestinalis* **Infection.**—*Arch. Intern. Med.* 1923. Oct. 15. Vol. 32. No. 4. pp. 522–529. [32 refs.]

In the course of 170 operations of duodeno-biliary drainage, during the last 2½ years, in New York, the author has encountered 9 cases of infestation with *Giardia intestinalis*, 3 of which submitted to treatment, by intravenous injection of arsphenamin at 3 to 5-day intervals. One case is said to have been cured by 3 injections, as judged by disappearance of cysts from stools 72 days after the third injection. In another case, in which three arsphenamin injections were alternated with three duodenal lavages of 30 per cent. solution of magnesium sulphate, the duodenal contents, examined on fourteen occasions during the following six months, were free from the parasite. In the third case cysts and active forms of the parasite were present in the stools 19 days after a treatment of 3 injections of arsphenamin.

A. A.

PAILLOT (A.). **Sur une nouvelle flagellose d'insecte et un processus d'infestation naturelle non encore décrit.**—*C. R. Acad. Sci.* 1923. Aug. 20. Vol. 177. No. 8. pp. 463–465. With 2 figs. [1 ref.]

The author has observed a Leptomonas—*L. chatoni*, a new species—in the blood of some caterpillars of the Noctuid moth *Agrotis pronubana*; it exhibits considerable polymorphism. All the parasitized caterpillars were also parasitized by the larva of an Ichneumon-wasp, *Amblyteles armatorius*. All the caterpillars, however, that were free from the Ichneumonid larva were also free from the Leptomonas. The author therefore surmises that the Leptomonas is transmitted from infected to healthy caterpillars by the ovipositor of the Ichneumon-wasp in the act of depositing its eggs in its victims.

A. A.

WADA (Yoshitsune). **Vergleichende Untersuchungen ueber die Wirkung einiger Saponine auf rote Blutkorperchen und Trypanosomen.** [The Action of Saponins on Red Corpuscles and Trypanosomes. A Comparative Study.]—*Biochem. Ztschr.* 1922. Vol. 130. pp. 299–303.

The object of the experiments here recorded was to determine the trypanocidal effect of saponin as compared with its haemolytic effect—*T. equiperdum* being the subject employed. The author premises that under the name of saponin are included vegetable products of which the haemolytic property is most extremely variable. In his experiments he used saponin (without qualification), saponin from guaiacum-bark, saponin from horse-chestnut, cyclamin, and solanin. The tabulated results show that all these substances are in various degrees haemolytic and trypanolytic, and that though the more haemolytic are the more trypanolytic, the respective concentration standards for haemolysis and trypanolysis are not in corresponding proportion throughout the series. Thus cyclamin—which is the most strongly haemolytic, though not the most strongly trypanolytic of all—has a minimum concentration for trypanolysis ten times less than that required for haemolysis, and in general the trypanolytic effect is most marked in those saponins of which the haemolytic concentration minimum is above 1 part in 10,000.

A. A.

i. ERBER (Berthe). **Action du serum de quelques vertébrés inférieurs sur les trypanosomes,** *in vitro,* **après injection de peptone.**—*C. R. Soc. Biol.* 1923. July 21. Vol. 89. No. 25. pp. 513–514.

ii. ——. **Modification du pouvoir trypanolytique de la lymphe des batraciens,** *in vivo,* **sous l'influence d'injections de peptone.**—*Ibid.* pp. 515–516.

i. The injection of peptone diminishes the trypanolytic power, *in vitro,* of the serum of certain mammals, and experiments are here briefly described showing that the same thing holds good for the serum of the eel and of the individual viper, but not for the serum of the toad, salamander, and slow-worm lizard.

ii. The serum and lymph of Batrachia is strongly haemolytic to mammals, and is also trypanolytic, and experiments are here briefly described showing that the injection of peptone (10 per cent. solution) diminishes these powers *in vitro.*

A. A.

CHATTERJEE (G. C.). **On a Tetrachilomastix n.sp. parasitic in Human Intestine.**—*Indian Jl. Med. Res.* 1923. July. Vol. 11. No. 1. pp. 177–180. With 2 plates. [8 refs.]

Said to be " very commonly found in India, in the stools of patients suffering from chronic intestinal complaints," but to seem to have " not much pathogenic property."

A. A.

WASSELL (Corydon McAlmont). *Isospora hominis* **discovered in China.**—*China Med. Jl.* 1923. Aug. Vol. 37. No. 8. pp. 661–663. With 1 text fig. [3 refs.]

The faeces in the subject of this case contained, besides oocysts of *Isospora hominis,* eggs of *Schistosoma japonicum* and *Ancylostoma duodenale* and cysts of *Giardia intestinalis.* The patient, an emaciated Chinaman with a much enlarged spleen, had, as items in his medical history, ascites, malaria, chronic bronchitis, and the forty-years' duration of stools containing blood and mucus; he was an indigent son of the soil and stated that, until he came 25 miles to Wuchang for treatment, he had never been so far away from home.

A. A.

RHODE (J.). **Ein Coccidienbefund** (*Isospora hominis*) **in dem Stuhl eines deutschen Kriegsteilnehmers aus der Türkei.**—*Klin. Woch.* 1923. June 25. Vol. 2. No. 26. p. 1222. With 2 figs. [5 refs.]

Finding of cysts of *Isospora hominis* in the stool of a German engaged in the war in Turkey.

A. A.

BEN-HAREL (Shulamite). **Studies of Bird Malaria in Relation to the Mechanism of Relapse.**—*Amer. Jl. Hyg.* 1923. Nov. Vol. 3. No. 6. pp. 652-685. With 3 plates & 9 figs. [24 refs.]

These studies of Proteosoma included 23 canaries infected from an original source in sparrows in New York.

Three types of infection were observed, namely: acute (4 cases); "extended irregular," which the author is disinclined to call chronic (16 cases); and benign (3 cases). *Acute infections* lasted 5 to 10 days, showed an immediate decrease of red cells after inoculation and another rapid decrease at the end of the incubation period (12 to 23 days), and then a returning increase, a large percentage being young forms, as the parasites decreased. In the *protracted and irregular infections* large fluctuations occurred in the number of parasites visible, and as the parasites increased the red cells decreased, and *vice versa*; a gradual decrease of red cells was observed during the incubation period. *Benign infections* were short and very mild; the changes in the red cell and parasite counts were similar to those described but less pronounced. In all infections the large uninuclear leucocytes increased and decreased in correspondence with the parasites.

Changes in the spleen and bone-marrow were periodically observed. In the *spleen* at the height of infection the endothelial cells were distended and contained large quantities of pigment, the capillaries were blocked with parasitized red cells, large uninuclears and mitotic forms were increased, and young parasites were present both free and attached to uninuclears. The pathological changes were greatly diminished in spleens examined at the end of the peripheral infection, and were not to be seen at all in spleens examined at intervals in latent (protracted) infections. In the *bone-marrow* in heavily parasitized birds the changes observed were decrease in adipose tissue and a preponderance of mitotic forms and uninuclears; dilatation of the venous capillaries; hyperplasia; and the presence of parasites both free and in red cells. At the end of infection the bone-marrow was recovering, and at different stages in a latent infection no significant pathological changes were observed.

Parasites at the height of infection were found in brain, liver, and kidney, but most of all in the spleen and bone-marrow; and towards the end of the infection, and during apyretic intervals, only in the spleen and bone-marrow. Up to six months after infection had disappeared from the blood a few parasites were found in the tissues after prolonged search. The parasites demonstrated were in various stages—trophozoites, schizonts, and gametocytes.

Relapses. Studies of the course of infection, of tissue-smears and sections, and of spontaneous and experimentally provoked relapses added convincing evidence in favour of the hypothesis that during non-febrile intervals parasites are present in certain internal organs as well as in very small numbers in the blood, where they continue the process of nonsexual reproduction.

[Although there may be nothing wonderfully novel in the results of these studies, yet the record of continuous and comprehensive observations of a considerable series of infections is of the greatest value.]

A. A.

SERGENT (Étienne), SERGENT (Edmond) & CATANEI (A.). **De la vaccination contre le paludisme des oiseaux, obtenue par l'inoculation d'un petit nombre de sporozoïtes vivants.**—*C. R. Acad. Sci.* 1923. July 30. Vol. 177. No. 5. pp. 364–366. [2 refs.]

Continuing their experiments on the induction of bird malaria (this *Bulletin*, v. 20, p. 303) the writers found that in 25 canaries injected with a suspension corresponding to two-thirds or three-quarters of a Culex normally infected with sporozoits, there occurred in 5 an intense infection, in 13 a very feeble one followed by an immunity, and in 7 neither infection nor immunity.

Clayton Lane.

SENEVET (G.) & WITAS (P.). **Évolution spontanée de l'infection à** *Haemoproteus columbae* **chez deux pigeons.**—*Arch. Instituts Pasteur de l'Afrique du Nord.* 1922. Dec. Vol. 2. No. 4. pp. 481–488. With 1 chart. [7 refs.]

Infections of Haemoproteus in two individual pigeons are here described and contrasted. One pigeon was infected when it was a squab, either all at once or several times at very close intervals. This infection occurred early in September 1920, and parasites appeared in abundance in the blood on the 27th September and continued in decreasing numbers until the 21st January 1921—about 4 months; on the 4th February they were again abundant until the 28th March, when they again disappeared; on the 19th August they re-appeared again, and disappeared on the 27th September, and since then they have no more been seen in repeated examinations throughout a whole year. The course of affairs is interpreted as a primary infection followed at lengthening quiescent intervals by two relapses, and then by (possibly) spontaneous cure. Both in the primary infection and in the relapses the parasites appeared in swarms in the ring form and gradually disappeared as much larger and sparser forms.

The other pigeon was of unknown age and had been infected for a long time, and probably many times, before being isolated for observation. In it also the parasites appeared and disappeared in the blood at intervals, but their appearances were more protracted, and their disappearances were shorter and less complete; and they did not make their appearance in swarms of small rings, though they disappeared as very sparse large gametes. Finally they disappeared altogether so far as examinations continued for a year went. It must, of course, be understood that both pigeons were properly protected from reinfection during the long terms of observation.

The authors remark that comparable phenomena are to be seen in human malaria. In Macedonia primary infections with a well-marked rhythmical relapse of parasites and fever were to be seen in the French army: among the natives of Algeria such distinct rhythm of relapse is not easy to recognize.

A. A.

SINTON (J. A.). **The Occurrence of** *Balantidium coli* **in the Faeces of an Indian.**—*Indian Med. Gaz.* 1923. Sept. Vol. 58. No. 9. pp. 432–433. [4 refs.]

Balantidium coli observed in the faeces of a native of Jhang, in the Punjab, a prisoner for 11 years in the Lahore jail. The stools were well formed and showed a few streaks of mucus and a little pus.

The Editor of the I.M.G. states in a footnote that this ciliate is said to be "relatively common" in pigs and sheep in tea-garden coolie-lines in Cachar, and also that a species of Balantidium has been seen in 2 of 4 pigs recently examined in Calcutta.

A. A.

BUISSON (Jean). **Sur quelques infusoires nouveaux ou peu connus parasites des mammifères.**—*Ann. Parasit. Humaine et Comparée.* Paris. 1923. Aug. Vol. 1. No. 3. pp. 209–246. With 21 figs. [47 refs.]

The first part of this paper contains diagnoses and figures of new genera and species of ciliates from the intestine of the African rhinoceros and elephant, the roe-deer, and the agouti. The second part is a complete revision, with diagnoses and some figures, of the ciliates known to be harboured in the alimentary tube of mammals.

A. A.

ARAGÃO (Henrique de Beaurepaire). [In Portuguese and French.] **Estudos sobre os Blastocystis. Études sur les Blastocystis.** *Mem. Inst. Oswaldo Cruz.* 1922. Vol. 15. No. 1. pp. 240–250. [Portuguese] [22 refs.]; 143–151 [French]. With 2 plates.

After reviewing the opinions of various workers on the nature of Blastocystis, the author describes and figures the structure and growth and multiplication of this enigmatic organism and comes to the following conclusions.

Blastocystis is not an evolutionary phase of any other animal or vegetable parasite, but is an independent parasite related to the Blastomycetes and particularly to the pathogenetic Saccharomycetes. It has two methods of prolification, namely (*a*) plasmotomy, or binary fission, which is the ordinary method, and (*b*) "sporulation," by formation of an encysted nest of secondary cysts something like ascospores in an ascus—a much rarer method. The existence of several species of Blastocystis is not sufficiently established. Blastocystis has no pathological significance.

A. A.

LYNCH (Kenneth M.). **The Occurrence of Blastocystis in Intestinal Inflammation, with a Note on** *Endolimax nana.*—*Jl. Amer. Med. Assoc.* 1923. Aug. 18. Vol. 81. No. 7. pp. 522–523. With 1 fig. [6 refs.]

Critical abstract of a case of acute diarrhoea, with passage of some blood and mucus, passing to a state of relapsing painless diarrhoea, accompanied with tenderness of rectum lasting for three months. In the mucosa of the inflamed rectum numerous small ulcers swarming with Blastocystis were observed—probably *B. hominis*. *Endolimax nana* also was present in the stools, but was not seen in the smears from the ulcers. The patient was otherwise in good condition and had a clean history, so that the author, who maintains a cautious and critical attitude, is inclined to agree with those who do not regard Blastocystis as harmless.

A. A.

VASCONCELOS (Angel Brioso). **The Algae of the Genus Chara and Mosquito Larvae.**—*Amer. Jl. Public Health.* 1923. July. Vol. 13. No. 7. pp. 543–546. With 1 fig. [7 refs.]

An account of the observed effects upon Culex larvae of water containing growing Chara [the evidence attributing the effects entirely to Chara, however, not being scrupulously free from ambiguity].

The author placed a plant of *Chara gymnophylla* [the genus Chara is ubiquitous in stagnant water] in a small wooden trough of water. Ten days afterwards he noticed that "an enormous number of Culex larvae had invaded " the water, and he killed them off with " a film of coal oil." Next day he flushed off the oil very thoroughly. Within the next 48 hours he observed a fresh swarm of Culex larvae in the trough, but they were all dead or moribund. Thinking that this disastrous state of the larvae was due to the remains of coal oil, he changed the water several times, and thereafter for two weeks—during which again the water was frequently changed—larvae appeared in the tank but were always dead or dying. The author's good intentions and preparations for rigorous experimentation were frustrated by the lateness of the season, but he is confident in his inference that *Chara gymnophylla* is a larvicide. [On this subject see this *Bulletin,* Vol. 15, p. 154; Vol. 17, p. 116; and Vol. 19, p. 113.]

A. A.

PARDO (L.). **[Observaciones acerca de la accion de la** *Chara* **sobre las larvas de los mosquitos.]**—*Bol. R. Soc. españa Hist. nat.* Madrid. 1923. Mar. Vol. 23. No. 3. pp. 154–157. [Summarized in *Rev. Applied Entom.* 1923. Oct. Vol. 11. Ser. B. Pt. 10. p. 160.]

These observations, made in Valencia rice-fields, confirm the inhibitory influence of Chara upon mosquito-breeding. *C. hispida,* which also can grow in deeper water, was found to be more efficacious in this respect than *C. foetida.*

A. A.

ALLUAND (C.). **[Rapport à Monsieur le Directeur Général des Services de Santé du Maroc sur une Mission antipaludique.]**—*Bull. Soc. Sci. nat. Maroc.* Rabat. 1922. Mar. 1. Vol. 2. No. 1 2. pp. 3–6. [Summarized in *Rev. Applied Entom.* 1923. July. Vol. 11. Ser .B. Pt. 7. p. 127.]

The interesting item of this report is the testimony that the species of Chara are of value in mosquito control. In Morocco no mosquito larvae have been found in water where *Chara connivens* is growing.

A. A.

CONNOR (M. E.) & MONROE (W. M.). **Notes on the Length of Time** *Aëdes calopus* (*Stegomyia*) **Larvae should be exposed to a Film of Kerosene.**—*Jl. Econom. Entom.* 1923. Aug. Vol. 16. No. 4. pp. 380-385.

This is a question that interests sanitary inspectors on the eastern coast of America where specially prepared softened water is used by washermen and is too valuable to be thrown away and too strongly alkaline for little fishes. Treating this water for 15 minutes with petroleum was found sufficient to destroy all the Stegomyia larvae, and treatment given for 5 to 10 minutes killed most of them.

A. A.

ROUBAUD (E.). **Les désharmonies de la fonction rénale et leurs conséquences biologiques chez les moustiques. Les faits et leurs applications.**—*Ann. Inst. Pasteur.* 1923. July. Vol. 37. No. 7. pp. 627–679. With 2 figs. [9 refs.]

The author appears to regard the life-cycle of *Anopheles maculipennis* as governed by a something which is indicated in the state of the Malpighian tubules. The larvae are apt to become asthenic by ingestion of their own nitrogenous excreta, and when kept in considerable number in an insufficiency of water they die with their Malpighian tubules hypertrophied; extensive tracts of water are therefore a necessity of their well-being. This argument explains why in places where larvae are obviously plentiful the adult insects are scarce, and where adults are plentiful larvae are hard to find. In the adult stage the dominating influence of the Malpighian function is manifest in the hibernation of the female. Hibernation, or "athermobiosis," is not, as most people suppose, a torpid state caused by cold, but is an inherent specific cyclical asthenic sterility, independent of cold, and characterized by hypertrophy of the Malpighian tubules and development of fat instead of eggs. Hibernating Anopheles are insects overloaded with nitrogenous waste and stricken with asthenia. If we reflect that in spring a new biological cycle begins, hibernation may be regarded as the obligatory purificative phase of rejuvenescence. The practical conclusion from these ingenious speculations—namely, that the time for dealing with Anopheles is in this cyclical phase of asthenia and renal insufficiency-- is not so new and strange as the general argument. It agrees well with the obvious conclusion that the species is offering itself to destruction, locally, when the sluggish females are congregated in their winter shelters.

A. A.

HAROLD (C. H. H.). **The Breeding of** *Anopheles maculipennis* **Meigen in Captivity.**—*Jl. Roy. Army Med. Corps.* 1923. Oct. Vol. 41. No. 4. pp. 282–290.

[Everyone who has tried it knows how difficult it is to rear that useful insect *Anopheles maculipennis* in the laboratory. It is easy enough to get fertile eggs from females caught in the spring, and to get happy young larvae from these eggs. But do what you will for their sustenance and comfort, the larvae sooner or later get sick, their mortality after the third moult becomes heartrending, and the final issue of several thousand eggs is, perhaps, a score of dwarf adults.]

At Aldershot, after several disappointments, Major Harold has succeeded not only in carrying one generation of *Anopheles maculipennis* through all the vicissitudes of larval life, but also in breeding their adult issue to the third generation, all within the walls of his laboratory.

The experiments were begun at the end of October and carried on through the winter, the first complete success being obtained in the later half of February. The laboratory is part of a wooden Army hut; it was heated by electric radiators, and atmospheric humidity was maintained by evaporation from the breeding tanks. The adult insects were fed at least twice a week on a partially-clipped rabbit, those that were disinclined to accept the rabbit could be induced to do so by an appetizing feed of banana; they were kept in ordinary mosquito cages, 20 × 24 × 20 inches, furnished with a small vessel of water. The larvae were reared in ordinary large glass tanks; and the medium most conducive to their quick growth and complete development was "a septic and evil-smelling" water, free, of course, from surface scum and from predatory aquatic insects, in which floating plants of forget-me-not (*Myosotis palustris*) were allowed to decompose. For successful breeding it was found that large numbers of recently emerged males and females must be in the cage; in such circumstances great excitement was observed to occur towards nightfall, and one night a pair were observed *in copulâ* on the side of a cage.

A. A.

ZETEK (James). **Anopheles breeding among Water Lettuce—a New Habitat**—*Proc. Med. Assoc. Isthm. Canal Zone.* 1920. Jan.-Dec. Vol. 13. Pts. 1 & 2. pp. 25–28. [4 refs.]

INGRAM & MACFIE, in Accra, found larvae of *Anopheles costalis* and *marshalli* in the floating rosettes of *Pistia stratiotes*, and the present author now reports finding larvae of *A. albimanus* and *tarsimaculatus* in the same specific Pistia harbourage, in waters of the Panama Canal zone. He has also observed Anopheles larvae sheltering in sheets of the ordinary small duckweed in those waters.

A. A.

i. BULL (Carroll G.) & KING (W. V.). **The Identification of the Blood Meal of Mosquitoes by Means of the Precipitin Test.**—*Amer. Jl. Hyg.* Baltimore. 1923. Sept. Vol. 3. No. 5. pp. 491–496.
ii. KING (W. V.) & BULL (Carroll G.). **The Blood Feeding Habits of Malaria-carrying Mosquitoes.**—*Ibid.* pp. 497–513. With 1 fig. [1 ref.]
iii. BULL (Carroll G.) & ROOT (Francis M.). **Preferential Feeding Experiments with Anopheline Mosquitoes. I.** -*Ibid.* pp. 514 -520. With 1 text fig. [6 refs.]

These papers form a trilogy.

i. In this paper are described the technique of the preparation of the sera used for identification of the blood found in the stomach of individual mosquitoes, and the method and results of the preliminary experimental investigation of their practical application. The blood was removed from the stomach of the dissected mosquito on filter paper, upon which it remained good for use for 3 or 4 months; if allowed to dry in the stomach of the mosquito it did not give satisfactory reactions. Multiple reactions were a great obstruction. Many specimens gave no reaction with the specific sera prepared (man and common domestic animals). Blood meals of mosquitoes were easily identified if the stomach had been got within an hour of feeding; a large percentage also from stomachs got 12 hours after feeding could be depended upon unless the insect had been kept in the ice-chest. Frequent failure of reactions with antihuman serum was a weak point.

ii. In the course of a study of malaria-carrying mosquitoes (chiefly *Anopheles quadrimaculatus*) in a plantation district in Louisiana, contents of the individual stomachs of a large series of insects were identified by the blood precipitin test described in the above paper. The insects were collected throughout the mosquito-season from representative houses in an area of about 5,000 acres; the blood identifications were made at Baltimore, each specimen being tested with 8 precipitin sera (man, horse, ox, dog, pig, sheep, cat, fowl); only definitely positive tests are included in the record. Practically 45 per cent. of the mosquitoes collected about dwelling-houses were found to contain fresh blood. Taking the whole collection throughout the season, from the entire area, the general averages of hosts were: cow 35·7 per cent., horse 32·6, pig 16·1, dog 8·3, man 4·3, fowl and cat together 3·0. The figures, of course, give no exact indication of food preferences. As the abundance of mosquitoes increased the proportion feeding on man appeared to decrease, probably because of the stimulus given to defensive measures. A very small proportion (slightly more than 1 in 1,000) of a large number of Anopheles examined contained sporozoites.

iii. The design of the ingenious and careful experiments recorded in full detail in this paper was to ascertain whether mosquitoes are guided by predilection, or merely succumb to propinquity, in satisfying their desire for blood. The dramatis personae were female *Anopheles quadrimaculatus*, horses, cows, and men ; and a hexagonal mosquito-proof shed, divided into six equal and similar stalls in such a way as to allow the introduced insects a free flight into all parts or any particular part desired, provided the stage and scenes. The following tests are recorded :—

(*a*) Horse A and cow A, stalled apart, and 250 insects liberated at dusk ; next morning 10 insects found gorged, 9 on cow, 1 on horse blood.

(*b*) Two horses (one being horse A) and cow A, severally stalled in such a way as to interpose a horse between the cow and the site of liberation of mosquitoes ; next morning 30 insects found gorged, 13 on horse, 17 on cow blood.

(*c*) Four horses and cow A, severally stalled, so that two horses were interposed between cow and liberated mosquitoes ; next morning, 60 insects found gorged, 40 on horse, 20 on cow blood.

(*d*) Old horse A and fresh cow B, stalled apart as before ; next morning, 38 insects found gorged, 23 on horse, 15 on cow blood.

(*e*) First experiment with horse A and cow A repeated twice ; of 53 and 46 gorged insects found, 20 and 10 contained horse, 33 and 36 contained cow blood.

(*f*) Horse stalled next to a stall where 2 men slept with face and neck and arms exposed ; next morning 111 insects found gorged, 51 on human, 56 on horse blood.

(*g*) Experiment *f* repeated with two horses arranged so that the insects had to pass horses before reaching men ; of 68 gorged insects, 20 had human, 48 had horse blood.

(*h*) Cow stalled next to a stall occupied as before by 2 men ; next morning, 122 insects found gorged, 91 on cow, 31 on human blood. This experiment was repeated four times, in each case more mosquitoes fed on cow than on man, the ratios being 1 to 4, 1 to 3, 1 to 2 and 1 to 7.

The authors regard the experiments as preliminary ; cool nights and the premature close of the Anopheles breeding season restricted their scope.

A. A.

LEGENDRE (J.). **Sur la zoophilie de certains moustiques et son application à la prophylaxie.**—*C. R. Acad. Sci.* 1923. Oct. 22. Vol. 177. No. 17. pp. 790–793. [3 refs.]

Knowing for many years a locality in Brittany where the mosquitoes —*pipiens* and *Anopheles maculipennis*—never bite man, the author applied himself for three summer months to the study of this question. He satisfied himself that in this Breton locality *Culex pipiens* has become " androphobe," and that *Anopheles maculipennis*, though its larvae may be found in domestic waters along with those of *C. pipiens*, does not bite man and is not even seen in houses. He therefore recommends that into places where these species *do* attack man stocks from places where they are known not to attack man should be introduced, to supplant them there.

A. A.

HARGREAVES (E.). **Entomological Notes from Taranto (Italy) with References to Faenza, during 1917 and 1918.**—*Bull. Entom. Res.* 1923. Oct. Vol. 14. Pt. 2. pp. 213–219. With 2 maps in text.

These notes include observations of *Anopheles maculipennis, bifurcatus,* and *superpictus,* but nothing new. Experiments with larvae of *A. bifurcatus* showed that they could not live as long as three days in a 0·005 per cent. solution of copper sulphate, and that solutions of that strength were more rapidly fatal than solutions of 0·1 and 0·05 per cent.

A. A.

RODENWALDT (Ernst). **Entomologische Notities II.** [Entomological Notes II].—*Geneesk. Tijdschr. v. Nederl.-Indië.* 1923. Vol. 63. No. 4. pp. 500–507. With 1 map. [1 ref.]

Contains much miscellaneous information. Some data point to the probability of *A. maculatus* being the malaria carrier on the island Alor; the *A. maculatus* was never before found to transmit malaria in the D.E. Indies.

W. J. Bais.

i. GALAMINI (Antonio). **La fauna anofelica della Maremma Grossetana e la lotta invernale contro la malaria.**—*Ann. d'Igiene.* 1923. Sept. Vol. 33. No. 9. pp. 627–639. [1 ref.]

ii. ZETEK (James). **The Panama Canal Species of the Genus Anopheles.**—*Proc. Med. Assoc. Isthm. Canal Zone.* 1920. Jan.–Dec. Vol. 13. Pts. 1 & 2. pp. 29–56. With 6 figs. [21 refs.]

iii. PINTO (Cesar). **Anophelinas de Angra dos Reis.**—*Brazil Medico.* 1923. Aug. 4. Year 37. Vol. 2. No. 5. pp. 77–81. With 10 figs.

iv. BUXTON (P. A.). **Anopheles Larvae from Palestine and Elsewhere.**—*Bull. Entom. Res.* 1923. July. Vol. 14. Pt. 1. pp. 75–82. With 9 text figs. [9 refs.]

v. SERGENT (Edm.) & FOOT (Katherine). **De l'utilisation des tritons pour la destruction des moustiques.**—*Arch. Instituts Pasteur de l'Afrique du Nord.* 1922. Dec. Vol. 2. No. 4. pp. 489–493.

RIVET (L.). **Utilisation des tritons pour la destruction des moustiques.**—*Presse Méd.* 1923. Aug. 4. Vol. 31. No. 62. pp. 1296–1297. [1 ref.]

i. The war against the Anopheles of the Maremma is much easier to wage in winter than in summer. Of the three local species *A. maculipennis* and *superpictus,* which hibernate as adults, can be destroyed in the stalls and stables where they congregate in winter, while the waters in which the larvae of *A. bifurcatus* pass the winter are less extensive at that season.

ii. This useful paper, which, besides describing the local species and their respective larvae, contains ample instructions for collecting and observing them and for recording all classes of facts observed, is intended for local sanitary inspectors.

iii. Figures and diagnoses of local, well-known, species.

iv. Comparisons of the larva of *Anopheles algerienis* and of *A. sergenti* with other species to which, respectively, they are akin.

v. A spirited account of the doings of young newts among mosquito larvae. [Newts, like other tailed Amphibia, are very sparely represented outside the northern temperate region.]

A. A.

WHITTINGHAM (H. E.). **Life-History of the Sandfly,** ***Phlebotomus papatasii.*** **(Abstract.)**—*Proc. Roy. Soc. Med.* (Sect. Trop. Dis. & Parasit.). 1923. Aug. Vol. 16. No. 10. p. 45.

Whittingham is to be congratulated on his protracted and laborious study of *Phlebotomus papatasii,* in Nature and in the laboratory.

The natural cycle, from extrusion of egg to emergence of adult, under suitable conditions of temperature and moisture, occupies about 6 weeks; but hibernation may normally occur in the prepupal stage, and by increasing the moisture, or lowering the temperature, of the atmosphere the larva stage may be prolonged experimentally for at least 6 months; the life of the adult may be prolonged in the laboratory to 30 days or more. Under normal conditions the egg hatches in 9 days, the larva has four instars of about 6 days each, the pupa stage lasts 9 days, and the adult female lives about 2 weeks.

The female sucks blood during the first 24 hours of life; pairing may occur in the next 24 hours; and eggs to the number of 40 are produced 6 to 10 days later.

The R.A.F. Sandfly Fever Commission has shown that the virus of Phlebotomus fever is transmitted from generation to generation, in two possible ways—either by inheritance or by the larva feeding on the excreta or dead bodies of infected parents in the breeding grounds.

A. A.

i. HILL (Gerald F.). **A New Australian Phlebotomus (Dipt. Psychodidae).**—*Bull. Entom. Res.* 1923. July. Vol. 14. Pt. 1. pp. 83–86. With 6 text figs.

ii. SINTON (J. A.). **Notes on Some Indian Species of the Genus** ***Phlebotomus.*** **Part II.** *Phlebotomus squamipleuris,* **Newstead. 1912.**—*Indian Jl. Med. Res.* 1923. July. Vol. 11. No. 1. pp. 65–78. With 2 plates. [2 refs.]

iii. BAYMA (Theodoro). **Biologia do "Phlebotomus Papatassi."**—*Ann. Paulist. Med. e Cirurg.* 1923. July-Aug. Year 11. Vol. 14. Nos. 7–8. pp. 67–69. With 6 text figs.

i. *Phlebotomus queenslandi* (n.sp.), described and figured—from the residential quarters of Townsville.

ii. *Phlebotomus squamipleuris,* originally discovered in the Sudan, is here recorded from the Punjab, the Central Provinces of India, and Madras, and is described in great detail.

iii. There is nothing new in this paper, which appears to refer to *Phlebotomus minutus.*

A. A.

GLASER (R. W.). **The Survival of Bacteria in the Pupal and Adult Stages of Flies.**—*Amer. Jl. Hyg.* Baltimore. 1923. July. Vol. 3. No. 4. pp. 469–480. [13 refs.]

This paper deals not with known pathogenic bacteria but with the normal bacterial flora of flies' intestines. It also contains a summary of the observations of FAICHNIE, BACOT, LEDINGHAM, NICOLL, and

GRAHAM-SMITH on the survival through the pupa and imago stages of pathogenic bacteria ingested in the larva stage, as well as references to the publications of other observers.

The author carefully sterilized the outer surface of pupae of house-flies, stable-flies, and horn-flies and found by culture that they contained within them bacteria which must have been ingested in the larva stage. He also sterilized the outer surface of just-emerged house-flies and found that they also contained bacteria within them, which had been passed on from the larva stage. The Stomoxys pupae contained fewer bacteria than the house-fly pupae, and the Lyperosia pupae very few at all. [Cp. experiments of WOLLMAN, this *Bulletin*, Vol. 18, p. 200.]

A. A.

PATTON (W. S.). **Some Philippine Species of the Genus *Musca* Linnaeus.** —*Philippine Jl. Sci.* 1923. Oct. Vol. 23. No. 4. pp. 309–322. [4 refs.]

Eleven species are dealt with critically, the diagnostic characters, habits, and necessary synonymy of each being given, as well as a key for their individual identification. Of the species of Musca generally, the author recommends separating them in 3 groups, namely (1) those that, like the house-fly, pester man in his dwellings and bazaars, do not bite, and lay their eggs in garbage and excrement of any kind; (2) those that pester animals, feed on their wounds, etc., though they do not actually bite, and breed chiefly in cow-dung; and (3) those, including Philaematomyia, that bite and suck blood and breed only in cow-dung.

A. A.

PATTON (W. S.). **A New Oriental Species of the Genus *Musca* with a Note on the Occurrence of *Musca dasyops* Stein in China and a Revised List of the Oriental Species of the Genus *Musca* Linnaeus.** *Phillipine Jl. Sci.* 1923. Oct. Vol. 23. No. 4. pp. 323–335. [4 refs.]

Twenty-nine species of Oriental Diptera are here admitted as valid and are listed with their several synonymies, conclusive or conjectural, and with occasional necessary notes. As the author has been at the great pains of searching out and examining the type specimens of 53 proposed Oriental species, his final determinations have an extraordinary value.

A. A.

SIMMONS (Perez).—**A House Fly Plague in the American Expeditionary Force.**—*Jl. Econom. Entom.* 1923. Aug. Vol. 16. No. 4. pp. 357 363.

Description of an insanitary camp at Lamanchs, in south-western France, and an infinite torment of flies. An epidemic of dysentery was followed by epidemic influenza and pneumonia, and the opinion is expressed that the severity of the two last diseases was a consequence of the fly-borne dysentery. Fortunately the men had been well inoculated against enteric before joining the camp.

A. A.

HOFFMANN (W. H.). **Chrysops Guiterasi.**—*Rev. Med. y Cirug. Habana.* 1923. Sept. 10. Vol. 28. No. 17. pp. 587–594. With 1 fig.

Discursive remarks on the habits and local distribution of Chrysops. Description and figure of *Chrysops guiterasi* described originally (in the *Bulletin of Entomological Research*, 1923, Vol. 13, p. 401) by BRUNETTI, not by " Bruner " as stated in this paper.

A. A.

SWYNNERTON (C. F. M.). **The Relation of some East African Tsetse Flies to the Flora and the Fauna.**—*Trans. Roy. Soc. Trop. Med. & Hyg.* 1923. June 21. Vol. 17. No. 3. pp. 128-141. With 19 figs.

It is well known that tsetse-flies are vitally dependent on shade, and considerably dependent on large mammals, though it is not so generally realized that each species has its own particular requirements in the way of shade in itself and in its associated large animals.

So far as East Africa is concerned the author distinguishes the following types of shade: (1) " Primary forest "—the forest primeval where the trees may be more than 200 feet high; (2) " Savannah "—which may be open grassland, or scrub, or light woodland, the first being due to conditions of the soil inimical to trees, or to continual grazing, or to native settlement; and all being stereotyped by annual grass fires in the dry season; (3) " Secondary thicket " where, as a result of too-early fires before the grass is dry as tinder, an open savannah becomes beset or even completely overwhelmed by heavy thickets and coppice; (4) " Desert formations," a sort of tropical steppe or bad land, too poor for any grass growth luxuriant enough to be affected by fires; (5) " Fringing associations," of very varied forest composition and of varying breadth, bordering lakes and streams and swamps: these waterside belts sometimes harbour *Glossina palpalis* and *brevipalpis* permanently, and *morsitans* during the rigours of the dry season: it has been suggested that the clearing of these alone might be enough to clear fly from a given area.

As regards the specific shade requirements of different East African tsetse-flies, *G. brevipalpis* haunts heavy thicket more or less overshaded; *G. palpalis* is a fly of waterside shade, which must here and there at least be dense; *G. austeni* is a heavy thicket fly; *G. pallidipes* affects the lighter type of thicket, not overshaded, and ranges farther afield in search of food than any other species known to the author; *G. morsitans* is a savannah-woodland and scrub fly, tending to congregate in the dry season at moist and shady spots; *G. swynnertoni* inhabits savannah with abundant thickets.

As regards relations to man, *G. palpalis* notoriously attacks the waterside populations; *G. pallidipes, morsitans,* and *swynnertoni* all come in contact with man, but *G. brevipalpis* is not aggressive.

In respect of the conjectured effect upon tsetse-flies of destruction of game, *G. palpalis* can fall back on reptiles and on man; and *G. morsitans* and *swynnertoni* could get on quite well with bush-pig, an animal which it would be impossible to exterminate, and they also would attack man. Apart from any questions of difficulty and expense and finality, the author is of opinion that tsetse cannot be either exterminated or precluded from infection by destruction of game. In the case of *G. morsitans* destruction of game in the dry-season concentration points of the fly might have some effect, direct or indirect.

A. A.

SWYNNERTON (C. F. M.). **Tsetse-Flies Breeding in Open Ground.**—*Bull. Entom. Res.* 1923. July. Vol. 14. Pt. 1. p. 119. With 1 plate.

On two occasions, in an open piece of ground near savannah woodland but itself quite devoid of overhead shade, the author found puparia of *Glossina morsitans*, associated on one occasion with a few of *G. pallidipes*. The author notes as a significant point that a high proportion of the pupae were dead.

A. A.

MACFIE (J. W. S.). **Report on the Distribution of Tsetse-Flies in the Neighbourhood of Accra.**—*Bull. Entom. Res.* 1923. July. Vol. 14. Pt. 1. pp. 25–29. With 2 plates and 1 map.

G. palpalis and *G. longipalpis* were found all along the hills to the west and north of the Accra plain; but the plain itself, except near the hills, is free from them.

A. A.

JACK (Rupert W.). **Tsetse Fly. A Four Years' Experiment in Game Elimination.**—*Rhodesia Agric. Jl.* 1923. Apr. & June. Vol. 20. Nos. 2 & 3. pp. 207–223. With 1 map; 329-348.

The subject of this interesting report is described as an experiment, though it is far from strict conformance with experimental methods. The author introduces his account with something of an appreciation of the view that tsetse-flies will naturally disappear with the extermination of game, a view that he seems to regard as demonstrated by the disastrous effects upon *Glossina morsitans* of the rinderpest epidemic of 1896 which in certain parts of S. Africa nearly exterminated the buffalo.

The area selected for the operations here described lay a few miles on either side of the Shangani River (about Lat. 18°S.) in the last 30 miles of its course--a forest tract with much game and a very thin and scattered population. In 1910 this area was free from fly (*Glossina morsitans*); by 1913 fly were established; in 1919 fly had spread to all the suitably shady parts of the forest. During four years' operations (1919-1922) 3,390 head of game were killed, and no doubt game generally fled from the disturbed area. " As the operations continued the tsetse-fly [*G. morsitans*] greatly decreased wherever comparative observations were made, and by October 1922 it had practically disappeared from a considerable tract." Concurrently with decrease of fly within the disturbed area the advance of fly continued in the undisturbed country outside it.

The compared observations on which these conclusions seem to be based were not continuous [and do not seem to have been made at any fixed and conditioned stations], but were made during brief visits. The area was visited every year in the month of October, that being a month when the fly tends to concentrate and the mornings are sunny. It was visited also in May of 1919 and 1921, in June of 1921 and 1922, in July of 1919 and 1922, and in August of 1920. Some stress is laid upon the October comparisons, though at the same time " it is to be emphasized that no claim is made that observations made in October of each year are accurate estimates of density of fly."

A. A.

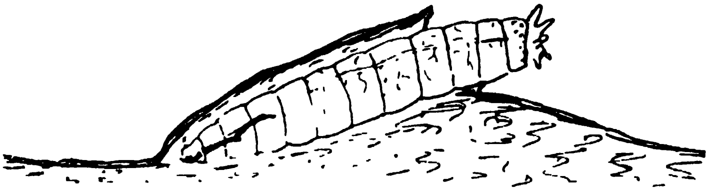
BLACKLOCK (B.) & THOMPSON (M. G.). **A Study of the Tumbu-Fly,** *Cordylobia anthropophaga* **Grünberg, in Sierra Leone.** *Ann. Trop. Med. & Parasit.* 1923. Dec. 21. Vol. 17. No. 4. pp. 443–510. With 5 text figs., 1 graph and 4 plates. [34 refs.]

This valuable study of the Tumbu fly and its doings is remarkable for its completeness ; it fills in many gaps in our knowledge of the life-history of the insect and gives us a connected history of the subject. The authors emphasize the fact, that the breeding flies that provided the material for the study were captured in the dry season, whereas the myiasis in man, for which the fly is responsible, occurs in the wet season and consequently has led some writers to suppose that the flies themselves are restricted to the wet season. From their own investigations the authors offer two explanations of this apparent incongruity : one is that the wild rat is the principal natural host of the larvae of the fly, and that when, in the wet season, the wild rats are flooded out of their burrows and seek the shelter of dwellings, the pregnant flies follow them ; the other is that the fly objects to a wet medium for the deposition of its eggs and therefore, during the wet season, itself seeks artificial shelter for that purpose. Although the pregnant female objects to a wet site for her eggs, the adult flies can stand a good deal of damp and cold ; but they are killed in 15 to 30 minutes by direct exposure to midday sun in a test-tube, and this explains why they may come into houses in the hot season without any intention of depositing their eggs there.

The female fly (in the laboratory) lives 14 to 15 days. Pairing occurs very soon after emergence. The select site for deposition of eggs is *dry* sand that has been contamination by animal excreta. A female may produce at least two batches of eggs at about 3 days' interval—up to 300 in the first batch and to 184 in the second—and dies 2 to 5 days afterwards.

The egg in a room usually hatches in 3 days, in an incubator at 37° C. in 1 day. It is killed by prolonged exposure to sun (4 days), but not by 48 hours in the ice-chest. Light ironing under three folds of cotton cloth (such as it would get in a laundry if eggs were deposited on drying clothes) is fatal.

The three stages of the larval life are described. The new-hatched larva is 0·75 to 1 mm. long. It is elongate spindle-shape, has a median mouth-hook, adapted for piercing skin, as in Hypoderma, and has numerous (14) tentacle-like processes at its posterior end. The cutaneous spinules are limited to restricted areas, and those of the last 3 segments are directed forwards. These young larvae become active only if disturbed. If left at room temperature they live for about 9 days—exceptionally 15 days. They can stand direct sun for two hours, and lived only 3 days in an incubator at 37° C. Twenty hours on ice did not hurt them, nor did complete submersion for long terms (up to 24 hours in one instance). Laundry treatment, as already described, is fatal. Penetration of the host's skin is effected *only* in this first stage, when the necessary median mouth-spine is present. The act takes from 25 seconds to 25 minutes, according to the thickness of the particular skin, and hardly attracts attention. Larvae will attack a cadaver and may complete their 1st stage in that situation ; but if an animal harbouring larvae of the 2nd or 3rd stage dies, the larvae escape and bury themselves in the soil ; or if they remain in the dead body they die. Oily applications are very obstructive to penetration by larvae. About the third day after penetration the larva moults.



First instar larva of *Cordylobia anthropophaga* penetrating skin.
[BLACKLOCK and THOMPSON.]
[Reproduced from the *Annals of Tropical Medicine & Parasitology.*]

The larva of the 2nd stage is 2·5 to 4 mm. long and is club shaped. The cuticular spines are more disseminated over the anterior half of the body, the tentacle-like processes at the after end of the body are very much reduced, the usual paired mouth-hooks are present. About the 5th or 6th day the second moult occurs.

The larva of the 3rd stage becomes full grown about the 7th or 8th day. [Its features are sufficiently well known.] Though the entire span of larval life is thus 7 or 8 days, its duration is influenced by the degree of suitablv of the host.

On exit from host the larva burrows in the soil out of sight, to pupate. The adult issues from the pupa-case in 10 or 11 days. Pupae kept in an incubator for 14 days at 37° C. did not afterwards give issue to adults, and it was inferred from experiment that this was the effect of heat, not of drought. Of 12 pupae kept for 3 weeks in an ice-chest, 9 emerged 5 days after release from the ice-chest.

In nature, although mammals of many species act as hosts to the larva of the Tumbu fly, the authors consider the wild rat to be its principal support; on making search they found living pupae in rat burrows. ROUBAUD, like others, has fixed upon the dog as the chief natural host and has recommended attention to dogs as the most promising prophylaxis. The authors agree that since the dog is a very frequent and ready host, and, unlike the wild rat, has no permanent entrenchments, there is something, though not all that is desired, in ROUBAUD'S recommendation.

Babies and puppies are more susceptible than adult individuals to Cordylobia myiasis. The authors' observations and experiments suggest and in part support, though they do not infallibly confirm their theory, that some of the relative immunity enjoyed by older individuals may be an acquired immunity; at any rate, they have experimental evidence that larvae do not always develop after getting through the host's skin, and that in some such cases (though in others they "encountered certain paradoxical results") there had been a prior tumbu infection. The matter is most certainly worthy of continued investigation.

The much-debated question of the mode of infection of man is discussed. The authors think there is something in the latrine theory, since the sand used there might contain larvae of the first stage and some of it might be spilt on the seat. Again, they know that a hard-pressed fly may lay its eggs on cotton, and they know of a case of tumbu myiasis that could be traced to the use, as a bandage, of a piece of clean cloth that had been left lying for some time; they do not think, however, that much is to be feared from clothes just come home from the washing, since any possible infestation would have been destroyed in the laundering. Natives lying on infested soil are obviously open to attack.

It is not amiss to draw attention to the authors' emphatic endorsement of a respectful attitude towards native accounts, however strange, of purely *natural* phenomena. The authors tell us that about the year 1862 the natives of Senegal gave certain Europeans a perfectly correct account of the natural history of tumbu myiasis; they quote the native report as well as the bland incredulous phrases of the European reporters.

A. A.

DAVIS (L. L.). **Myiasis of the Ear.**—*U.S. Nav. Med. Bull.* 1923. Sept. Vol. 19. No. 3. pp. 345-348.

Two cases of myiasis of the ear are here recorded; in both, a fly actually invaded the auditory canal; and in both, there was a past history indicative of some slight inflammation of the canal [that might possibly have made the canal attractive]. In both, the first symptoms, appearing the day after the removal or voluntary exit of the fly, were boring pain and a " sizzling " in the ear, and the first examination revealed maggots in the tympanum as well as the external auditory canal. Instillations of a lotion of equal parts of chloroform and milk immediately killed the larva and relieved the symptoms; but before this treatment was adopted injections of 1 in 1000 $HgCl_2$ solution, irrigation with warm boric lotion, instillation of 5 per cent. carbolized oil, of pure mineral oil, and of 10 per cent. solution of chloroform in milk had been tried without effect.

The maggots were not identified, but were thought to be *Cochliomyia macellaria.* In both cases many larvae were washed out, in one case 190 were counted.

A. A.

GEDOELST (L.). **Note sur la larva du** *Gasterophilus haemorrhoidalis* **et description de la larve d'une nouvelle espèce africaine.**—*Ann. Parasit. Humaine et Comparée.* Paris. 1923. Aug. Vol. 1. No. 3. pp. 269–275. With 3 figs.

The author makes known that the Oestrid larva from African Equidae, hitherto identified with *Gastrophilus haemorrhoidalis* Bauer, is not that species at all, but is a " new " species, now and here figured, and described as *Gastrophilus pseudohaemorrhoidalis.* This new species seems to be restricted to Africa, where it has an extensive range.

For comparison the larva of *G. haemorrhoidalis* Bauer, which is a Palaearctic and Nearctic species and does not occur in Africa, is also figured and described.

A. A.

ROOT (Francis Metcalf). **Notes on Larval Characters in the Genus Sarcophaga.**—*Jl. Parasit.* 1923. June. Vol. 9. No. 4. pp. 227–229. With 1 plate.

The maggots of Sarcophaga are distinguishable by their posterior stigmatic or spiracle plates. The peripheral ring of these plates is broadly incomplete at the lower inner corner. The spiracle clefts also approach the vertical. The author finds that he can distinguish two types of stigma and spiracle in Sarcophaga maggots; in the one, exemplified by *S. communis*, the inner side of the ring is nearly vertical, and ends in a knob, and the spiracle clefts are narrow and are crossed by a large number of anastomosing bars; in the other, exemplified by *S. ochracea*, the inner side of the ring has a strong centripetal curve which tapers to a point, and the spiracle clefts are broader and crossed by fewer bars. Specific differences can also be observed in the anterior spiracles, in Sarcophaga.

A. A.

i. SAITO (Tokio). **[Ueber die Myasis interna und einige Experimente ueber die Larve von Sarcophaga carnaria.]**—*Ig. Chuo Z.* Tokyo. 1921. Vol. 18. pp. 1445–1449. With 1 fig. [Summarized in *Japan. Jl. Med. Sciences.* Tokyo. 1922. Vol. 1. No. 1. p. 66.]

ii. PATTON (W. S.). **The Identification of the Larvae of the Diptera (Flies) which cause Naso-Pharyngeal and Aural Myiasis in Man.** -*Jl. Laryngol. and Otol.* 1923. Jan. Vol. 38. No. 1. pp. 18 27. With 19 text figs.

iii. GALLI-VALERIO (B.) & DE WERRA (M.). **Premier cas d'infection à *Hypoderma bovis* de Geer chez l'homme en Suisse.**—*Schweiz. Med. Woch.* 1923. July 25. No. 30. pp. 701-702. [7 refs.]

i. Larvae of flesh-fly, *Sarcophaga carnaria*, found in faeces of an acute diarrhoea case. [Experiments not recorded in the summary.]

ii. This useful paper covers a considerable part of the author's paper in the *Bulletin of Entomological Research* for Nov. 21 (see this *Bulletin*, Vol. 19, p. 486).

iii. The parasite was identified as a larva of *Hypoderma bovis* in its second stage. The tumour, which was quite like a bovine "warble," was situated behind the mastoid region and was extremely painful. There was no history of any signs of migration.

A. A.

FERGUSON (E. W.). **[Fleas.]**—*Australian Zoologist.* Sydney. 1923. June 7. Vol. 3. No. 3. pp. 114–118. With 1 plate. [Summarized in *Rev. Applied Entom.* 1923. Sept. Vol. 11. Ser. B. Pt. 9. pp. 150-151.]

Deals with the 33 known Australian species. The human flea (*Pulex irritans*) commonly infests pigs and probably develops on the hedgehog. The cat and the dog flea are of universal distribution. The rat flea, *Xenopsylla cheopis*, exists in Sydney, Queensland and West Australia, but its further range has not been ascertained. The European rat-flea, *Ceratophyllus fasciatus*, is common in the South of Australia. Another rat flea, obtained from Franklin Island, is *Xenopsylla nubica*. *Ctenopsylla musculi* is of little importance. The ubiquitous *Echidnophaga gallinacea*, which appeared in Western Australia two years ago, is now a serious pest, attacking poultry, dogs, horses, and even man. *Echidnophaga myrmecobii*, a parasite of the rabbit in New South Wales and of the rat in South Australia, may also spread.

A. A.

DUNN (Lawrence H.). **Fleas of Panama, their Hosts and their Importance.**—*Amer. Jl. Trop. Med.* Baltimore. 1923. July. Vol. 3. No. 4. pp. 335–344. [1 ref.]

The fleas here recorded are *Pulex irritans* (not very common), *Xenopsylla cheopis*, *Ctenocephalus felis* (very common), and *C. canis* (found once on a dog). *Rhopalopsyllus dunni* (on jungle rats), *R. klagesi* (on spiny rats) and *R. cacicus* (on anteater and ocelot). *Dermatophilus penetrans* and *Echidnophaga gallinacea*.

The common rats are the ubiquitous *Mus norwegicus, rattus,* and *alexandrinus. M. rattus* is extending its range into the jungle; even *M. norwegicus* has taken to the bush to some extent; and thus there may be exchanges of fleas between the indigenous jungle-rats and them.

A. A.

VAN STEENIS (P. B.). **Enkele gegevens over** *Loemopsylla cheopis* **en** *Pygiopsylla ahala* **in verband met de epidemiologie der pest.** [Some Facts about *L. cheopis* and *P. ahala* in Connexion with the Epidemiology of Plague.]—*Geneesk. Tijdschr. v. Nederl.-Indië.* 1923. Vol. 63. No. 4. pp. 570–596. With 1 chart. [8 refs.]

The flea index depends largely on the place where the rats are caught; in godowns as a rule it is higher (11–16·8) than in human dwellings (1·6–2·4). The author explains this by the more favourable breeding conditions of the flea in the godowns (dust, darkness, humidity, lack of ventilation). There exists a periodical variation of the flea index concurrent with probably the seasonal recurrence of plague. The index of *L. cheopis* did not reach its summit in the wet season; the production of larvae is independent of changes in humidity and temperature as observed at Soerakarta (Java). There is no sufficient proof of the existence of secondary flea concentration, *i.e.*, concentration of the fleas on the surviving rats during an epizoötic.

Pygiopsylla ahala is not a typical out-door flea, as asserted by OTTEN. In the plain the rats' nests in human dwellings are too dry, but at greater altitudes (above 1,000 M.) the humidity is sufficient to warrant a regular breeding of this flea.

The author supports SWELLENGREBEL'S criticism (see this *Bulletin*, Vol. 20, p. 360) of HYLKEMA'S views of the importance of the human flea in the epidemiology of plague (*l.c.*, Vol. 19, p. 373) and offers further argument for this criticism.

W. J. Bais.

CRAGG (F. W.). **Observations on the Bionomics of the Bed-Bug,** *Cimex lectularius* **L., with Special Reference to the Relations of the Sexes.** *Indian Jl. Med. Res.* 1923. Oct. Vol. 11. No. 2. pp. 449–473. [5 refs.]

The author's account of the astonishing sexual phenomena displayed by the bed-bug have been noticed in this *Bulletin* (Vol. 18, p. 26): the present paper records a mass of detailed observation under ingenious experimental conditions in attempts to discover the functions and the fate of the constant streams of spermatozoa, so greatly in excess of the requirements for simple fecundation of ova, by which the body-cavity of the insect is inundated. The experiments, though they did not elucidate the secondary functions of the sperm, showed at least that they are not merely stored up, since after a single union with a male a feeding female cannot produce anything like a normal complement of eggs, and after having produced to the limit of her capacity is—so far as very thorough examination of spermathecae and oviduct and ovarioles goes—quite clean of spermatozoa; moreover, if a female that has been fertilized is starved for a sufficiently long term she does not resume egg-laying when feeding is resumed. These observations, as the author remarks, tend to justify in some measure BERLESE'S idea of hypergamesis.

A. A.

BLACKLOCK (B.). **A Pyrrhocorid Bug Capable of biting Man.**—*Ann. Trop. Med. & Parasit.* 1923. Oct. 13. Vol. 17. No. 3. pp. 337–345. With 1 text fig. [15 refs.]

The bug in question is the omnivorous *Dysdercus superstitiosus*› a congener of the notorious "cotton-stainers" (which damage other crops besides cotton). The author describes how he was bitten by *Dysdercus superstitiosus,* and goes on to consider not only its history and habits, but also its infective potentialities, and the pathogenic significance of Hemipterous insects in general, in a very interesting paper.

A. A.

BRUG (S. L.) & HAGA (J.). **Verslag een onderzoek naar de geschiktheid van "Lotol" als middel ter verdelging van wandluizen bij toepassing van de hierbij verstrakte spray.** [Report on the Suitability of "Lotol" as an Eradicator of Bugs, when applied with the Spray delivered with it].—*Geneesk. Tijdschr. v. Nederl.-Indië.* 1923. Vol. 63. No. 4. pp. 641–642.

"Lotol" is a brown aromatic liquid. When applied with the spray it kills the larvae, but the imagines only if they are wet all over. If applied to infested furniture it does not sufficiently reach the bug hidden in crevices.

W. J. Bais.

MACARTHUR (W. P.). **Tick Paralysis.**—*Jl. Roy. Army. Med. Corps,* 1923. Aug. Vol. 41. No. 2. pp. 81–86. [14 refs.]

The object of this paper is to direct attention to tick-paralysis, as an accident which, not being of obtrusively obvious causation, may possibly be of much wider occurrence than is at present supposed. The author also records short notes, supplied by Dr. A. C. NASH, of British Columbia, of four cases. In one of these (a presumed case) a wood-tick was found on a child who had died suddenly; in another a drowsy and paralysed child rapidly recovered when a wood-tick was found (on its neck) and removed; in another case two wood-ticks were found on the back of the head of a child who had died in forty-eight hours; in another case a man suffering from paralysis made a rapid recovery when a wood-tick that was found embedded in his groin was removed. The ticks sent to the author as those to which "the cases seemed to be traceable" were *Dermacentor venustus.*

A. A.

MACKENZIE (J.). **Acari in Specimens of Urine.** [Correspondence.]—*Jl. Roy. Army Med. Corps.* 1923. Aug. Vol. 41. No. 2. pp. 157–158.

With reference to the cases in which mites were discovered in urine in patients suffering from urinary troubles (see this *Bulletin,* Vol. 20, p. 473) the observer, after carefully controlled investigations, found that mites were obtainable only from urine sent to the laboratory in bottles, and that bottles taken from their packing of hay or straw might contain specimens of Tarsonemus, Glyciphagus, and Tyroglyphus. From one bottle Glyciphagus, alive and dead, and in all its stages, was obtained. "It would appear," therefore, "that the occasional presence of acari in specimens of urine is due to the hay or straw sometimes used in packing glassware and to the resistance of chitin to the action of heat and chemicals."

A. A.

ESCOMEL (E.). **Les Pseudo-méloïdes du Pérou et la Pseudoméloïdine. Emploi de ces insectes en thérapeutique à l'epoque des Incas.** —*Bull. Soc. Path. Exot.* 1923. Oct. 10. Vol. 16. No. 8. pp. 615–621.

This paper supplies a digestible account of the blister-beetles of Peru, several species of which are briefly characterized. Some of the physical and chemical properties of their blood, of which cantharidin is either the sole or the chief active principle, are described, as well as its vesicant effects when applied in the fresh state to the skin of animals. The blood, squeezed from the fresh-killed beetle, has been used in Peru, from the days of the Incas, for the removal of warts and corns.

A. A.

PAILLOT (A.). **Sur une technique nouvelle permettant l'étude vitale du sang des insectes.**—*C. R. Soc. Biol.* 1923. Apr. 21. Vol. 88. No. 13. pp. 1046–1048.

By the application to invertebrate blood of Doyon's method of rendering vertebrate blood incoagulable the author has made some elegant and interesting observations on caryocinesis, and the behaviour of parasitic flagellates in the blood of a caterpillar, and has been able to provoke waves of caryocinesis by inoculation of harmless microbes, peptones, and various albuminoid substances. Doyon's method of preventing coagulation without sensibly altering the composition of the blood depends on the action of nucleic acid. The author employed nucleic acid extracted from the mesenteric ganglia of the ox, making an alkaline solution of 2 per cent. nucleic acid, 0·5 per cent. carbonate of soda, and 0·4 per cent. sodium chloride. One drop of this solution was injected into the body-cavity of a caterpillar (of *Agrotis pronubana*).

i. RUSSO (—). [**Prolégomènes à l'étude des rapports entre la nature des terrains et le développement des parasites humains au Maroc.**]—*Bull. Soc. Sci. nat. Maroc.* Rabat. 1921. Dec. 31. Vol. 1. No. 7–10. pp. 157–165. With 6 figs. [Summarized in *Rev. Applied Entom.* 1923. July. Vol. 11. Ser. B. Pt. 7. p. 127.]

ii. BALFOUR (Andrew). **Modern Weapons against Insect-borne Diseases.**—Reprinted from *Medical Press and Circular.* 1923. Aug. 22 & 29. 20 pp. [53 refs.]

ii. GLADSTONE (H. B.). **The Harvest Bug.** [Memoranda.]—*Brit. Med. Jl.* 1923. Sept. 8. p. 415.

v. KISHIDA (Kiukichi). [**An Interesting Mite excreted with the Human Urine.**]—*Dobutsugaku Zasshi.* 1921. Vol. 33. No. 398. pp. 438–443. With 4 text figs. [Summarized in *Japan Jl. Zool.* Tokyo. 1922. Vol. 1. No. 1. (Abstracts.) p. 9.]

i. These prolegomena from Morocco illustrate the argument that the local distribution of human parasites is influenced by the local topography and physiography.

ii. This is a concise and readable summary of the multifarious methods for the control of mosquitoes that have been employed or proposed during recent years. Some novel experiments for destroying fleas and tsetse-flies also receive comment.

iii. In the treatment of the irritation caused by the Harvest-mite the author recommends the application of methylated spirit, in the early stage of itching, or 1 per cent. carbolic lotion well rubbed in. These are better than the messy though effective sulphur ointment.

iv. Merely gives the name *Tetranychina tuberculata.* [The species of this genus of the "red spider" family live upon plants.]

A. A.

MONTANA. **The Montana State Board of Entomology. Fifth Biennial Report 1922-23.** [COOLEY (R. A.), Secretary.]—32 pp. With 2 charts & 1 fig.

An increase of the number of cases of Rocky Mountain spotted fever having occurred in 1921, the United States Public Health Service came to the aid of the local State Board of Entomology and among other things established a field station for research in the Bitter Root Valley. The Biological Survey has also continued its co-operation. Another devoted person—making now the fourth--engaged in the investigation of the disease became infected and died. The Rodent Control regulations have been continuously enforced, but although ten species of rodents are known to be susceptible and to be capable of infecting ticks, the work of destruction has been concentrated on the Columbian ground-squirrel, since besides being the chief comforter of immature ticks, it is also a serious pest of agriculture. By the regulations the State bears the cost of survey and administration, and the landowner the cost of the poison and the labour of setting it ; the weak point of this arrangement is the anxiety of the landowner to keep his share of the expense down.

Experiments in the cultivation of the specific organism in tissue cultures have been continued, at Harvard. The organisms were found to grow as long as the tissue cells of the culture survived.

A. A.

FAUST (Ernest Carroll). **Practical Parasitology in South China.**—*Jl. Trop. Med. & Hyg.* 1923. Sept. 1. Vol. 26. No. 17. pp. 273-275.

The author complains that notwithstanding the magnificent lead given long ago by MANSON in Amoy, our knowledge of the parasitology of Southern China is far behind that of Indo-China and of the Loo Choo Islands and Formosa, and he also laments that Medical Entomology in China has been entirely neglected. Little is known about the varieties of malaria existent. Relapsing fever is common in spring in the central Yangste valley, but it has not been sufficiently studied there nor is its incidence elsewhere known. Little information is available as to the occurrence of broncho-spirochaetosis and the incidence of yaws. It is quite possible that coccidiosis, kala azar, and Japanese river-fever occur in Southern China, but no exact knowledge of these matters exists. Tapeworms are rarely reported, but how much this may be due to lack of observation is a question to be asked. Trematodes are common in certain places, but the manner of dissemination and the exact distribution of the different species has still be be ascertained. The same may be said of the roundworms ; and the reason why microfilariae are so seldom present in the blood of elephantiasis patients in Southern China has still to be explained.

A. A.

CHANDLER (Asa C.). **Speciation and Host Relationships of Parasites.**—*Parasitology.* 1923. Sept. Vol. 15. No. 3. pp. 326-339. [24 refs.]

A speculative paper, interesting but not qualified for abridgement. The author seems to incline to the view that the little if constantly differing forms of a specific parasite occurring in different species of hosts of the same class, or in different regions of the body in the same species of host—forms such as the various sarcoptes, itch-mites and Trichomonas, etc., etc. to which specific names have been applied—are better regarded as races—host races—of a single zoological species.

A. A.

LOTKA (Alfred J.). **Biometrics.—Contribution to Quantitative Parasitology.**—*School of Hygiene & Public Health. Johns Hopkins Univ. Collected Papers.* Vol. 4. No. LXXVIII. Reprinted from *Jl. Washington Acad. Sci.* 1923. Apr. Vol. 13. No. 8. pp. 152–158. With 2 figs. [6 refs.]

The problem of quantitative parasitology here considered in set mathematical terms is the calculation of the quantitative relations subsisting at any time between a population of host organisms and a specific parasite organism preying upon it. It is a paper only for those who believe with HOBBES that geometry is the only Science that it hath pleased the divine powers hitherto to bestow on mankind.

A. A.

CAIUS (J. F.) & IYENGAR (K. R. K.). **Notes on the Concentration of Anti-Cobra Serum. I. Concentration *in vacuo* and Dilution.**—*Indian Jl. Med. Res.* 1923. Oct. Vol. 11. No. 2. pp. 601–609. With 2 charts. [3 refs.]

The antivenene used in the experiments here recorded was the Kasauli antivemon (Cobra & Russell's viper). Its cobra-neutralizing power was standardized for the animals used (pigeons) and the effect upon it of concentration by drying *in vacuo* was investigated. It was found that it might be reduced to two-thirds its original bulk without any increase of potency per cc., and that by further concentration to *one-fourth* its original bulk a final product of only *twice* the original potency was obtained. There is thus ultimately an apparent loss of cobra-neutralizing power in the course of concentration—but only apparent, because by diluting the concentrated product up to the original volume the whole original potency is then revived. The hypothetical explanation is that during the process of concentration an " antivenene-protein-aggregate " is formed which inactivates part of the antivenene and is resolved into its component parts again when the concentration is sufficiently diluted. Experiments designed to find support for this hypothesis showed not only that the Kasauli antivemon may be diluted with its own volume of water or saline without any change of total potency, but also—in confirmation of the observations of BRAZIL and of HOUSSAY and NEGRETE with other antivenomous sera—that dilution often enhances the total potency. The authors' practical conclusions for this antivemon are that a two-fold increase of potency against cobra-venom (which is all that could be obtained in these experiments) is of little value; and that in the treatment of cobra-poisoning it is advisable to dilute it with its own volume of distilled water, or of saline, in order, without diminishing its neutralizing power, to lessen the danger of serum sickness.

A. A.

Mylrea (C. Stanley G.). **A Note on the Treatment of Scorpion Sting and the Sting of Venomous Fishes in Arabia.**—*Trans. Roy. Soc. Trop. Med. & Hyg.* 1923. June 21. Vol. 17. No. 3. pp. 210–211.

For the treatment of the sting of the species of scorpions of which the venom is not dangerous the author recommends a juxtaposed injection of 3 grains of novocaine in 5 to 15 minims of adrenaline solution. Similar treatment he has found efficacious for the sting of some of the venomous fishes.

A. A.

i. Cleveland (L. R.). **Correlation between the Food and Morphology of Termites and the Presence of Intestinal Protozoa.**—*Amer. Jl. Hyg.* Baltimore. 1923. July. Vol. 3. No. 4. pp. 444-461. [5 refs.]

ii. Delanoë (P.). **Au sujet du Parasitisme dû à la Limnatis nilotique du Maroc.**—*Maroc-Médical.* 1923. Aug. 15. No. 20. pp. 242-243.

iii. Milton (Frank). **Note on the Molluscan Hosts of the Human Schistosomes.**—*Jl. Trop. Med. and Hyg.* 1923. June 15. Vol. 26. No. 12. pp. 211-213. [12 refs.]

iv. Galli-Valerio (B.). **Parasitologische Untersuchungen und Beiträge zur parasitologischen Technik.**—*Cent. f. Bakt.* 1. Abt. Orig. 1923. Oct. 31. Vol. 91. No. 2. pp. 120-125. With 3 figs. [5 refs.]

i. The author has examined, for intestinal parasites, practically all the termites in the U. S. National Museum, and all his observations indicate that in a colony those castes that feed solely on wood harbour intestinal protozoa, and those castes that rarely or never feed on wood do not harbour them.

ii. The author draws attention to a former paper of his on the subject of the trouble caused to man and beast in Morocco by the freshwater leech *Limnatis nilotica*, and on the manner of ridding cisterns, etc., of these leeches by introducing eels.

iii. This paper deals with perplexities of zoological nomenclature.

iv. A miscellany of parasites and hosts are mentioned here, mostly merely by name and without arrangement, occasionally with some discursive remarks. New species of Nosema and Eimeria are introduced, each in a few lines, amid these jottings.

A. A.

Ashworth (J. H.) & Turner (A. Logan). **A Case of Rhinosporidiosis.**—*Edinburgh Med. Jl.* 1923. Aug. N.S. Vol. 30. No. 8. pp. 337-351. With 3 plates. [20 refs.] See this *Bulletin*, Vol. 20, p. 451.

Bach (F. W.) & Kiefer (K. H.). **Ueber die Verbreitung parasitischer Darmprotozoenarten des Menschen innerhalb Deutschlands.**—*Arch. f. Schiffs- u. Trop.-Hyg.* 1923. Vol. 27. No. 5. pp. 145–169. [35 refs.]

Baqué (B.) & Kieffer (J. J.). **Existence de** ***Stegomyia fasciata*** **au Sahara, à 500 kilomètres de la côte mediterranéenne.**—*Arch. Instituts Pasteur de l'Afrique du Nord.* 1923. May. Vol. 3. No. 2. pp. 169–171.

Barraud (P. J.). **A Revision of the Culicine Mosquitoes of India. Parts III, IV and V.**—*Indian Jl. Med. Res.* 1923. July. Vol. 11. No. 1. pp. 214–219; 220–223; 224–228. With 4 plates.

Bogrow (S. L.). **Die Kriechkrankheit (Creeping Disease,** ***Larva migrans*****).** *Gastrophilus cutis.*—*Dermat. Woch.* 1922. June 3. Vol. 74. No. 22. pp. 519–523.

Brèthes (J.). **[Un** ***Phlebotomus*** **nuevo para la República Argentina (*****Phlebotomus cortelezzii*****)].**—Reprinted from *La Semana Med.* Buenos Aires. 1923. No. 8. 12 pp. With 3 figs.

Brug (S. L.) & Haga (J.). **Aanteekeningen omtrent muskieten.** [Notes on Mosquitoes.]—*Geneesk. Tijdschr. v. Nederl.-Indië.* 1923. Vol. 63. No. 4. pp. 635–640.

Cavassa (Nicolas E.). **Algunas observaciones sobre el estegomyia calopus. Comunicación presentada al Sexto Congreso Médico Latino Americano reunido en la Habana (Cuba).**—*Cronica Méd.* 1922. Nov. Vol. 39. No. 713. pp. 484–488.

Christophers (S. R.). **The Geographical Distribution of the Anophelini.**—*Trans. 4th Congress Far Eastern Assoc. Trop. Med.* 1921. Vol. 1. pp. 421–430.

Clark (Francis). **An Address on Man's Insect Enemies.**—13 pp. Hong Kong: Printed by Noronha & Co., 3, Wyndham Street.

Cooling (L. E.). [**On the Larval and Pupal Stages of** *Myzorhynchus bancrofti*, **Giles, 1902.**]—*Proc. R. Soc. Queensland, 1921, Brisbane.* 1922. Jan. 16. Vol. 33. pp. 166–173. With 1 text fig. [Summarized in *Rev. Applied Entom.* 1922. Oct. Vol. 10. Ser. B. Pt. 10. p. 204.]

Cornwall (J. W.). **On the Structure of the Salivary Pump in Certain Blood-Sucking and other Insects.**—*Indian Jl. Med. Res.* 1923. Apr. Vol. 10. No. 4. pp. 996–1007. With 6 plates and 15 figs.

Da Cunha (Aristides Marques) & Pacheco (Genesio). **Sobre os flagellados intestinaes do homem.**—*Brazil Medico.* 1922. Dec. 2. Year 36. Vol. 2. No. 48. p. 349.

Gambier (A.). **Un cas probable de pseudo-myiase rampante.**—*Bull. Soc. Path. Exot.* 1922. Dec. 13. Vol. 15. No. 10. pp. 1018–1019.

Hegner (Robert W.). **Nuclear Division within the Cysts of the Human Intestinal Protozoon** *Chilomastix mesnili.*—*Amer. Jl. Hyg.* Baltimore. 1923. May. Vol. 3. No 3. pp. 349–353. With 9 text figs. [3 refs.]

Hisikari (Saneo). [**On the Poisonous Fishes found in the Marshall Islands.**]—*Nihon Biseibutsugakkwai Zasshi* (*Jl. Japan Microbiol. Soc*). 1922. Dec. Vol. 16. No. 12. [Summarized in *Japan Med. World.* Tokyo. 1923. Apr. 15. Vol. 3. No. 4. p. 83]

Iyengar (M. O. Tirunarayana). **The Larva of** *Anopheles annandalei.* **Prashad.**—*Indian Jl. Med. Res.* 1922. Oct. Vol. 10. No. 2. pp. 526–529. With 1 plate.

King (W. V.) & Bull (Carroll G.). **Blood feeding Habits of Malaria-carrying Mosquitoes at Mound, La.**—*Amer. Jl. Hyg.* Baltimore. May. Vol. 3. No. 3. pp. 354.

Kofoid (Charles A.) & Swezy (Olive). **Mitosis and Fission in the Active and Encysted Phases of** *Giardia enterica* **(Grassi) of Man, with a Discussion of the Method of Origin of Bilateral Symmetry in the Polymastigote Flagellates.**—*Univ. California Public. Zool.* 1922. Mar. 7. Vol. 20. No. 8. pp. pp. 199–234. With 4 plates and 11 text figs. [30 refs.]

Komp (W. H. W.). **Guide to Mosquito Identification for Field Workers engaged in Malaria Control in the United States.**—*Public Health Rep.* 1923. May 18. Vol. 38. No. 20. pp. 1061–1080. With 17 text figs.

Larrousse (F.). **Présence de** *Phlebotomus perniciosus* **Newst. dans le départment de l'Oise.**—*Bull. Soc. Path. Exot.* 1923. Jan. 10. Vol. 16. No. 1. pp. 16–17.

Leiva (Lamberto). **La protozoologia y el lugar que debe ocupar en el plan de Estudios medicos. Protozoology with Special Reference to its Place in the Medical Curriculum.**—*Jl. Philippine Islands Med. Assoc.* 1922. May-June. Vol. 2. No. 3. pp. 157–160. [Spanish text.]

Martini (E.). **Kritische Bemerkungen zur Theorie der " misanthropen " oder " zoophilen " Anophelen.**—*Arch. f. Schiffs- u. Trop.-Hyg.* 1922. Vol. 26. No. 9. pp. 257–265.

Musgrave (William Everett). **Flagellate Infestations and Infections : Giardiasis, or Lambliasis ; Trichomoniasis : Prowazekiasis, Cercomoniasis, Chilomastixiasis and Tetramitiasis.**—*Jl. Amer. Med. Assoc.* 1922. Dec. 30. Vol. 79. No. 27. pp. 2219–2221.

Neiva (Arthur) & Pinto (Cesar). **Dos reduvideos hematophagos encontrados no Districto Federal e estado do Rio de Janeiro com a descripcao de uma especie nova.**—*Brazil-Medico.* 1923. Jan. 27. Year 37. Vol. 1. No. 4. pp. 45–47.

NEWSTEAD (R.). *Glossina ziemanni*, **Grünberg, a Synonym of** *Glossina palpalis* **Sub-Species** *Fuscipes*, **Newstead.**—*Ann. Trop. Med. & Parasit.* 1923. Dec. 21. Vol. 17. No. 4. pp. 533–534. [1 ref.]

NOC (F.). **Sur l'embryon acariforme et less stades larvaires des Linguatulidés.**—*Bull. Soc. Path. Exot.* 1923. May 9. Vol. 16. No. 5. pp. 340–346. With 6 text figs. and 1 plate.

PALLARY (Paul). **Faune malacologique des eaux douces de la Tunisie.**—*Arch. Instituts Pasteur de l'Afrique du Nord.* 1923. Vol. 3. No. 1. pp. 22–47. With 1 plate and 1 text fig.

PINTO (Cesar). **Anatomia, Biologia e Distribuição Geographica da** *Cellia brasiliensis* **Chagas, 1907.**—*Sciencia Med.* Rio de Janeiro. 1923. Sept. 30. Vol. 1. No. 3. pp. 143–147. With 4 figs.

——[In Portuguese and German.] **Sobre uma amoeba do genero** *Vahlkampfia* **encontrada no homen. Ueber eine Amöbe der Gattung** *Vahlkampfia* **beim Menschen.**—*Mem. Inst. Oswaldo Cruz.* 1922. Vol. 15. No. 1. [pp. 122 126 Portuguese.]. [47–49 German.] With 1 plate (9 figs.). [34 refs.]

ROBERTSON (Andrew). **Specimens from a Human Case of Infection with** *Dientamoeba fragilis*, **Jepps and Dobell, 1917.**—*Proc. Roy. Soc. Med.* (Sect. Trop. Dis. & Parasit.). 1923. Aug. Vol. 16. No. 10. p. 48.

ROUBAUD (E.). **Sur les conditions physiologiques du zootropisme chez les moustiques.**—*C.R. Acad. Sci.* 1923. Nov. 19. Vol. 177. No. 21. pp. 1066–1068. [4 refs.]

SENEVET (G.) & EBERT (G.). **Contribution à l'étude des myiases nord-africaines. Deux cas de myiase cutanée dûs à des Sarcophaginés.**—*Bull. Soc. Path. Exot.* 1923. June 13. Vol. 16. No. 6. pp. 415–416. [3 refs.]

—— & PARROT (L.). **Présence à Sedd-ul-Bahr de** *Phlebotomus papatasi* **(Scrop).**—*Arch. Instituts Pasteur de l'Afrique du Nord.* 1922. Sept. Vol. 2. No. 3. p. 419.

SINTON (J. A.). **Notes on Some Indian Species of the Genus** *Phlebotomus*. **Part I. Introduction and Description of** *Phlebotomus annandalei*, **n.sp.**—*Indian Jl. Med. Res.* 1923. Jan. Vol. 10. No. 3. pp. 742–753. With 1 plate.

STARK (H. H.). **Ophthalmia Myiasis Externa, due to Larvae of** *Oestrus ovis*.—*Jl. Amer. Med. Assoc.* 1923. Nov. 17. Vol. 81. No. 20. pp. 1684–1685. With 2 figs.

WOODLAND (W. N. F.). *Porocephalus pomeroyi*.—*Jl. Trop. Med. & Hyg.* 1923. Feb 1. Vol. 26. No. 3. pp. 45–46.

——**A Justification of** *Porocephalus pomeroyi*, **Woodland 1921.**—*Parasitology*, 1923. Mar. 22. Vol. 15. No. 1. pp. 39–42. With 7 text figs. [4 refs.]

REVIEWS AND NOTICES.

KNOWLES (R.). [Major, I.M.S., Protozoologist, Calcutta School of Tropical Medicine.] **Lecture Notes on Medical Protozoology.**—pp. iv + 236. 1923. Calcutta: Printed by D. N. Banerjee at the Banerjee Press, 2, Maharani Sarnamoyee Road. [Price Rs. 5 or 7/-.]

In the compass of two hundred and thirty-six pages there is here concentrated for the student of Medical Protozoology an enormous amount of information of a very practical nature. The notes are not intended to be a substitute for actual lectures, text books or practical instruction and laboratory work in Protozoology, but their object is to serve as a guide and reminder of what the student has already had explained to him more fully or has actually seen or carried out himself in the laboratory. They embrace practically everything that a medical practitioner in the tropics is required to know about the Protozoa which cause disease in man. The information given has been gathered from authoritative sources and from the author's own experience, and is presented in a clear and emphatic style, large print being used to call attention to important points or to warn the student of pitfalls which are likely to beset his path. The various books and papers dealing with any particular subject and which might be consulted with profit are indicated, and here again the student is cautioned against the use of certain literature which is likely to mislead him.

There are in all twenty lectures which deal with the Sarcodina, Mastigophora, Sporozoa and Ciliophora, which are undoubted Protozoa, while the Spirochaetes, together with the Chlamydozoa, Negri bodies, Kurloff bodies, Rickettsia and other structures of doubtful nature receive attention. The status of each group is considered, and full information regarding the pathogenicity, life histories, structure, method of examination, detection, preparation, preservation, and culture of the members of each group which parasitize man is given. Certain important forms which occur in animals and throw light on the human parasites, or are nearly related to them, are also dealt with. The important coprozoic Protozoa, which often confuse the investigator, are included. Where doubt exists regarding any point the author has expressed this clearly and boldly, and has given some indication as to problems which require solution.

Mistakes appear to be very few and far between. One such appears on page 204, where the author writes of Stegomyia as being the anopheline carrier of yellow fever. In another part he inclines to the view that *Prowazekia* is distinct from *Bodo*, while the statement that malarial parasites are not subject to phagocytosis but only their residual pigment requires some qualifications. On page 54 again the information given that there may be other intestinal flagellates of man, besides Trichomonas, Chilomastix, and Giardia, but that not one of them has yet been properly described is certainly incorrect. These are, however, minor points, and the student of Medical Protozoology can rest assured that if he keeps these lectures by his side and uses them while he is reading or working in the laboratory, he will have a trustworthy guide to help him over many difficulties and bring him to a clear understanding of a subject which often seems at first sight peculiarly confused and incomprehensible.

C. M. Wenyon.

NEATBY (Edwin A.) & NEATBY (T. Miller) [Edited by], with a Foreword by Sir James CANTLIE. **A Manual of Tropical Disease and Hygiene for Missionaries.**—pp. xix + 687. With 20 plates (14 coloured) & 118 figs. & charts in text. 1923. London: John Bale, Sons & Danielsson, Ltd. 83–91, Great Titchfield Street, Oxford Street, W.1. [Price 12/6 net.]

This book recalls the days when the earnest student purchased a "Vade mecum," a work which, in the words of "Everyman," "will go with thee through Life and be thy Guide." With one notable exception their vogue seems to have passed away. Now we have "Text Books" and "Manuals."

In order to understand the origin and contents of this Manual a quotation is necessary:—

> "The publication of this volume is made easy by the large-hearted and large-minded benevolence of the late Mrs. Honyman-Gillespie, of Edinburgh, who left by will a sum of money in the hands of trustees for the advance and dissemination of medical knowledge old and new, especially mentioning homoeopathy." (Preface.)

Thus *Homoeopathy* stands side by side with "Orthodox" methods. It is discussed in the "Introduction"; pp. 619–623 are devoted to it and at the end of each "Disease" there is a section allotted to *Homoeoptherapy*. In the "Foreword" Sir James CANTLIE writes:—"Orthodoxy in medicine is an unknown quantity, for the ebb and flow of science is with us now as it always has been, and ever will be." Be that as it may be. The reviewer does not accept, as sound, the principles upon which Homoeopathy is founded, and cannot admit that treatment with vaccines and serums is in keeping with those principles. His knowledge of the practice of Homoeopathy is nil; nevertheless if you want a shillingsworth of meat it will not avail to offer the butcher a penny. For the rest we can congratulate the Editors on their industry and its results. They have ransacked the literature of tropical medicine and made good use of the spoils; always courteously acknowledged. The section on Hygiene is practical and well illustrated. Since the manual "is intended for non-medical readers" the missionaries require something brief and dogmatic upon which they can act in emergencies or when professional medical aid is not at hand. This and more they have got. It would be hypercritical to pick out here and there small matters not free from doubt; but we cannot accept Conorhinus as a "bug" *and* a "beetle" (v. Phylum opposite p. 612). Mr. Gerald DUDGEON has contributed a very useful chapter:—Arthropoda affecting Mankind.

Full instructions are given for intravenous injections of drugs, serums and saline solutions, there is a most excellent glossary of medical and scientific terms and a good index. A word of praise must be given to the coloured plates and to the illustrations, many of them original, all well chosen.

J. H. Tull Walsh.

EDWARDS (F. W.). **Mosquitoes and their Relation to Disease. Their Life-History, Habits and Control.**—*British Museum* (*Nat. Hist.*). *Economic Series*. No. 4. 3rd Edition. 20 pp. 1923. London: Printed by Order of the Trustees of the British Museum. [Price Fourpence.]

So far as the life-history of mosquitoes goes, this little pamphlet is admirably clear and concise. It is, however, a pity—if the pamphlet is intended to serve any useful "economic" purpose—that the pages on mosquitoes and disease and those on the control of mosquitoes were not written in consultation with a medical man having some knowledge of malaria and malaria-parasites (which the author tells us are the cause of a " tropical and subtropical disease " and were discovered in 1898) and of " elephantiasis " (which the author appears to regard as another name for filariasis), and also some practical acquaintance with sanitation in countries where mosquitoes are dangerous.

A. Alcock.

DRINKWATER (H.). **Fifty Years of Medical Progress 1873-1922.** pp. x+183. With 37 illustrations on 35 plates. 1924. London: H. K. Lewis & Co., Ltd. [Price 10s. 6d.]

Despite its attractive title this is not an inspiring book. An era originated by PASTEUR cannot be dealt with in the manner of a dictionary, where the great creative discoveries that have brought new seas into our ken, and the brilliant explorations that have followed, are put on a level with the minor performances of the tide-watchers ashore. Taking the book as a dictionary of medical progress, however, and judging it from our own standpoint, we are bound to say that the progress made during the last fifty years in our knowledge of the causation of the diseases conveniently classed as " tropical "—progress that has had a marked influence upon medicine at large—does not receive in its pages either true diction or verity of extolment. The pregnant discoveries made by MANSON and by ROSS are certainly described as being, respectively, " of paramount importance " and " brilliant." These discoveries—in particular that of MANSON—extended the medical horizon, but even their essential facts are not here correctly or exactly stated. Under the heading *Parasites* all that we find is the single lax statement " 1893. Smith and Kilburne [*sic*] showed that they can be transmitted by Arthropoda,"—nothing more, nor any supplementary references. Under *Trypanosomiasis* are confused together " Pyrosoma," yaws, and African relapsing fever; while the work of KLEINE and of KINGHORN and YORKE is unnoticed, equally with Chagas's disease and the suggestive life-history of *Trypanosoma cruzi*. Under *Snake Venom* nothing is to be found but a single extravagant general statement attributed to FRASER: the pregnant subject of antivenoms is entirely ignored. There is one obscure and imperfect reference to the connexion of lice with typhus, but nothing whatever is said about the work that has disclosed the relation between plague and rat-fleas, and among other productive discoveries entirely ignored are that by FEDSHENKO of the development of the larval guinea-worm in Cyclops; that by THOMAS of the post-embryonic development of the liver-fluke; that by MAIYARI and SUZUKI of the post-embryonic development of *Schistosoma japonicum*; and that by JANICKI and ROSEN of the early developmental stages of the ribbon-worm in certain Cyclopidae. Other obvious omissions are the absence of any allusion to the pathogenetic significance of house-flies, particularly in epidemics of typhoid, and to the ubiquity of latent human carriers of *Entamoeba histolytica,* both of which are subjects of universal interest and importance.

Though not anxious to touch matters outside the scope of this *Bulletin*, we cannot refrain from comment upon an item headed " *Immunity* " which states that nothing is definitely known about the " mechanism of immunity " and that the first experiments on immunization were made in 1886 by Theobald SMITH, and refers to METCHNIKOFF without even faint praise and to PASTEUR not at all; and also upon an item entitled *History of Medicine* that does not contain any reference to the inspiring work of Professor SINGER.

A. Alcock.

TROPICAL DISEASES BUREAU

TROPICAL DISEASES BULLETIN.

Vol. 21.] 1924. [No. 3.

ANIMAL VENOMS: A REVIEW.

By Lt.-Col. A. Alcock, C.I.E., M.B., LL.D., F.R.S., *Assistant Director, Tropical Diseases Bureau.*

A much outstanding episode in this story has been the publication of Madame Phisalix's great work, *Animaux Venimeux et Venins*, already reviewed in this *Bulletin* (Phisalix 1922); from whatsoever point of view regarded, it is, in the words of its sponsor, Laveran, the most comprehensive and complete volume existing in any language on the science of animal venoms. From this vast array of facts we are led to the conception of animal venoms as not merely a means of defence and attack against gross outward dangers, peculiar to a few special groups of animals, but rather as products of the widest prevalence in the animal metabolism, subtilely influencing nutrition and thereby promoting that cellular resistance which forms the natural defence against the invisible dangers of the microcosmos. And from this clear standpoint the author's prophetic eye foresees for animal venoms a local habitation among pharmacologists and a name in rational therapeutics.

Snake Venoms.

Much has been done in recent years to extend and particularize our knowledge of snake-venoms along established, mainly physiological, lines; but it seems unlikely that research of this sort, however interesting, will be further reproductive until it looks beyond its immediate application to the treatment of snake-bite. In reviewing recent publications it will be convenient to take first those that deal comprehensively with snakes and their venoms from every point that comes in the purview of the medical man; then those that have mostly to do with treatment, and particularly with antivenenes; and finally those of which the interest, for the present, is almost entirely physiological and chemical.

Of the first kind, must be mentioned, before all, "Studies in the Treatment of Snakebite" by Acton & Knowles (1914–1915) and Vital Brazil's "La Defense contre L'Ophidisme" (1914); both are works of universal interest, although the former is based on the snakes of India and the latter on those of South America; both have been reviewed at considerable length in this Bulletin (ix. p. 237 & vi. p. 236).

PHISALIX (1922) also treats snakes and their venoms in most comprehensive detail. Of a more limited interest are YAMAGUTI'S two papers on the venomous snakes of Formosa. The second of these (1923), which is an amplification of the first (1922), is a monograph of the Thanatophidia of the island, and, proceeding along beaten roads, goes very fully into all the anatomical details of the venom apparatus, physiological effects of venom, action of antivenenes, etc. KAISER (1921) deals with the venomous snakes of the Dutch East Indies and the preparation of antivenenes there; and KRAUS (1922) with the aglyphe and opisthoglyphe Colubridae of Brazil and (1923*b*) with the venomous snakes of that country, though he gives us nothing unexpected. Reference may here be made to a paper by HOUSSAY (1923*b*) on deadly snakes of the Argentine and the amounts of venom yielded by several local pit-vipers.

To take next recent papers dealing with antivenenes and of other matters bearing on treatment.

C. & M. PHISALIX showed some time ago that rabbits immunized to the mucous venom of the salamander became to a limited extent refractory to the virus of rabies and, conversely, METCHNIKOFF stated that the serum of rabbits vaccinated with rabies is remarkably active against snake-venom; some regard must therefore be paid to the "summary," published without any details in the *Japan Medical World*, of a paper by YAMAGISHI (1922), wherein it is stated that a rabbit immunized to "adder" venom was found subsequently to be immune to the "virus of hydrophobia."

Although CALMETTE appears to have always had an open mind on the subject, and although PHISALIX showed that immunity to hornet venom conferred a limited immunity to viper-venom, other authorities have until quite lately insisted most positively upon the strict specific limitations of antivenenes. KRAUS and BOTELHO (1923*a*, 1923*b*), however, record experiments suggesting that antivenenes contain primary and subordinate antitoxins, or at least have quantitative as well as qualitative values which can be determined only by experimentation. These authors found that *Elaps frontalis* antivenene after an hour's contact can neutralize (at 37°C.) a four-fold equivalent of *E. corallinus* venom, and (at 32°C.) a lethal equivalent of *Crotalus terrificus* venom, although the Crotalus antivenene does not neutralize the Elaps venom; they also found that after contact for an hour at 37°C. scorpion antivenene can neutralize *Lachesis lanceolatus* venom, and conversely that snake antivenene can neutralize scorpion venom. We are here reminded of EHRLICH'S toxones and toxoids. WILNER, again (1923), relates the case of an Arab wounded by a scorpion, where the vivid effects of the scorpion venom were relieved at once by a small injection (3 cc.) of ophidian antivenene originally obtained from the Lister Institute. Furthermore, HOUSSAY and NEGRETE (1923*a*) in a paper containing a list of the amounts of specific venoms neutralized by the various antivenenes prepared at their Institution, state that although antivenenes are specific they are not so strictly so as to be entirely impotent against venoms of closely related species. Incidentally these authors confirm the fact that "normal" (? unheated) horse-serum has a certain power of neutralizing snake-venom; they state that it nearly always neutralizes 1 to 3 lethal doses of several specified venoms, and in the case of *Ancistrodon piscivorus* venom can neutralize 5 lethal doses. This property of (unheated) horse-serum may have to be borne in mind in connection with the argument of KRAUS & BOTELHO.

To turn to less stimulating topics, GOMES (1920) records experiments contrasting the efficacy of Lachesis antivenene when administered promptly with its failure when delayed; HOUSSAY and NEGRETE (1921*a*) have a paper on the varying duration of activity of different antivenenes and on standarding the value of a kept serum, and another (1921*b*) on the mathematical expression of the neutralizing powers of antivenenes; and KRAUS (1923*b*) gives some statistics of results of cases of snake-bite treated by antivenene in Brazil. Two papers by GIOSEFFI (1923) on viper-bite and its treatment do not contain anything arresting, and the same may be said of accounts of several cases of snake-bite summarized in the Medical Zoology section of this Bulletin, although it may be mentioned that CROLEY (1922) in describing a case of cobra-bite happily treated with antivenenes and other things attributes some of the success to the adjuvancy of atropin.

Coming next to work of which the interest is mainly physiological or biochemical, mention must first be made of the very important series of papers by HOUSSAY and NEGRETE (1918) and HOUSSAY and SORDELLI (1918). These authors have investigated in comprehensive detail the diastatic, cytolytic, haemolytic, and thrombotic properties not only of the principal snake-venoms of South America, but also of the venoms of some of the notorious snakes of Asia and Australia. Further researches on the action of various snake-venoms (*a*) upon the blood have been carried out by HOUSSAY and NEGRETE (1922), by HOUSSAY, OTERO, NEGRETE and MAZZOCCO (1922), and by DO AMARAL (1921) and upon the heart by MAGENTA (1922); (*b*) upon globular resistance, by AQUINO (1920); (*c*) upon nerve and muscle by HOUSSAY and PAVE (1922), HOUSSAY, NEGRETE and MAZZOCCO (1922), and by HOUSSAY and GUGLIELMETTI (1923); and (*d*) upon the bulbar centres by PACELLA (1923). HOUSSAY and NEGRETE (1923) also have described in detail the action of the venom of *Lachesis ammodytoides*, which appears to be typically viperine; and HOUSSAY (1923*a*) in comparing the local effects of some different species of venoms shows that they are not parallel with their several haemolytic and coagulant properties. ISHIHARA (1920) describes the physiological action upon tissue—particularly upon muscle—of the venoms of cobra and Lachesis, and SUZUKI (1921) describes the histology of the acute and chronic nephritis caused by the venom of *Lachesis flavoviridis*. A suggestive paper, deserving particular attention, is that by GUNN and HEATHCOTE (1921) on tissue-immunity—as distinguished from blood-immunity—to cobra venom; the experiments of these authors show, inter alia, that in laboratory animals the heart and intestine (the particular tissues tested) acquire immunity independently of the antitoxin circulating in the blood. Of minor papers those of CATAN (1921) and CATAN DE HOUSSAY (1921) on the adsorption of snake-venom by charcoal, and that of ASSUMPÇÃO (1922) on the specific differentiation of snakes by the blood-precipitin test may be mentioned. A series of papers by KRAUS (1923*a*) on the properties of antivenomous serums produced in Brazil must also be mentioned.

Venomous Amphibia.

The cutaneous venoms of toads and salamanders are fully described and discussed in Madame PHISALIX's great work (1922). They are derived from two sources, namely from mucous glands disseminated in the skin, and from "granulous" glands massed in definite formations at particular spots in the dorsal integument, as in the parotid regions of the toad. More recently Madame PHISALIX (1923) has investigated these venoms in *Bombinator pachypus* (a species akin to the firebelly toad and having a very poisonous reputation): the mucous venom causes paralysis, finally of respiration, and in warm-blooded animals (mouse) hypothermia; the granulous venom is convulsant and afterwards paralytic. NOVARO (1922, 1923) has examined the parotid (granulous) venoms of toads of Buenos Aires: locally they cause inflammation and suppuration, and their general effect is mydriatic, salivatory, convulsant and paralytic, finally involving the breathing mechanism; the chief toxic constituent in *Bufo marinus* is said very much to resemble adrenalin (although it does not modify the coagulation of the blood). MATSUSAJI and KABEDA (1918) have dealt at some length with the cutaneous venom of *Triton pyrrhogaster*; it contains two distinct toxins—a haemolysin, and a neurotoxin that first excites and then paralyses the skeletal muscles and, finally, respiration.

Venomous Fishes.

PHISALIX (1922) devotes 143 pages to venomous and poisonous fishes and describes the venom-apparatus and venom of some of those that can inflict a serious wound with spine or tooth. KABESHIMA (1918) appears to have carried out an exhaustive investigation of the venom of *Plotosus anguillaris*, one of the common Indo-Pacific catfishes; it seems to be produced by cystic distensions of the glands at the base of the great dorsal and pectoral spines, and to contain a haemolysin, and a "spasmin" acting on the medulla and cortex. The reviewer had some personal experience, about 35 years ago, of the venom of *Plotosus arab*; a finger wound from a young fish not 3 inches long caused—besides excruciating pain—numbness and paresis of the arm, lasting for several days; in sections of well fixed decalcified material no special glands other than the slime glands of the skin—were found. In a paper by EVANS (1923) glandular masses are described and figured in the grooves of the dorsal spine of the stingray (*Trygon pastinaca*), the piked dogfish (*Acanthias vulgaris*), and the Port Jackson shark (*Cestracion philippi*); in the same paper some of the effects of the venom of the well-known weever fish are described. Two cases of wounding by stingrays are recorded in the *Archives de Médecine et Pharmacie Navales* for November 1922, and ESSERTEAU (1920) describes the effects of a venomous wound inflicted by an Indo-Pacific species of Aploactis (Scorpaenidae).

Scorpion Venom.

This is a subject particularly well treated by Madame PHISALIX (1922). The venom of different species of scorpions, as of snakes, varies very greatly in virulence, some species being known to be more than twenty times more venomous than others. HOUSSAY (1919) describes the physiological effects of the venom of *Buthus quinquestriatus* and *Tityus bahiensis*; it is a muscle poison of the veratrin type, affects arterial tension like adrenalin, and is a powerful salivary and lachrymal stimulant. KRAUS and BOTELHO (1923*a*) suggest that scorpion antivenom, like snake antivenom, contains primary and secondary antitoxins, since in their experiments a scorpion antivenom after an hour's contact at 37°C. could neutralize *Lachesis lanceolatus* venom. WIENER (1923), conversely, found that Lister. ophidian antivenom was a swift antidote to scorpion venom. As already said in connexion with this argument, it may have to be borne in mind that normal horse-serum, if unheated, can neutralize at any rate some snake-venoms to a considerable extent.

Spider Venom.

Recent observations have again confirmed the existence of truth in the strangest spider stories. ESCOMEL's work on *Lathrodectes mactans* and *Glyptocranium gasteracanthoides* is reviewed, inter alia, in Madame PHISALIX's monograph, and further observations by ESCOMEL (1919) have been summarized in this Bulletin (xvii, 126). HOUSSAY & NEGRETE (1919) also have recorded the serious or fatal effects of the venom of Lathrodectes and other Theraphose spiders on laboratory animals, and BAERG (1923) gives the personal experience of a Thomas who would not believe until he had felt the effect of Lathrodectes venom for himself. SUTHERLAND and others (1921, 1922) describe the symptoms following the bite of an Indo-Australian species, *Lathrodectes hasselti*, and LOUIS (1921) and CAVASSA (1921) report the unpleasant or serious consequences of the bite of some unspecified spiders.

Attention may be drawn here to papers by DODD (1921) and McCORMACK (1921) on Tick-bite paralysis.

Centipede Venom.

Conflicting observations justify the natural assumption that the venom of centipedes differs in virulence, like that of snakes and scorpions, in different species. Thus while CORNWALL (1916), in his excellent and comprehensive account of three Indian species, states, from experiment, that their venom is little toxic, BAYLEY DE CASTRO (1921) describes the bite of a certain Andaman species as being not only extremely painful but also as having serious consequences. PINEDA (1923) also records 4 cases of centipede bite in the Philippines in which local symptoms—inflammation, spreading oedema, numbness, and formication—might be followed by lymphadenitis persisting for a week or more ; one of these cases - a girl of 7 years, bitten, during sleep, in the head—ended fatally in about 29 hours, and at the necropsy besides the superficial oedema there was congestion of the meninges. LEVY (1923) has discovered an haemolysin in the venom of certain centipedes. In some species the venom acts directly; in other species the haemolytic action is elicited only after the venom—even in minute quantities—has been in contact with yolk of egg. This latter catalytic effect is comparable to that produced in the same circumstances with cobra venom.

Venom of Medusae (Jelly-Fish).

Cases of lesions following contact with unspecified "jelly-fish" have been recorded by ALLEN (1920) and STEWART (1922). The local rash in ALLEN'S case was followed by profuse weeping eczema, by aphonia, and by laryngitis lasting for four weeks. AOKI (1922, 1923) portrays the severe effects, besides urticaria, of stinging by *Olindioides formosa*—shock, acute cardiac distress, dyspnoea, muscle pains, and as a possible sequela, emaciation. The reviewer, from his experience in the Indian Marine Survey, can endorse the statement as to serious and enduring sequelae to stinging by medusae.

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LEPROSY.

MUIR (E.). **Some Notes on the Transmission of Leprosy.**—*Indian Med. Gaz.* 1923. Dec. Vol. 58. No. 12. pp. 572-575. With 1 chart.

The available facts enable us to decide with a moral certainty how the bacillus enters the body. The organism cannot be cultivated, and healthy human beings in a good climate are commonly insusceptible even to inoculation with it. Among 60 members of the menial staff of the Calcutta School of Tropical Medicine 8 per cent. had leprotic anaesthetic patches without knowing it. Advanced mutilated begging anaesthetic lepers with trophic ulcers are not infective, as their skin and ulcers are free from the bacilli, although the Indian leper act is erroneously based on the belief that they are the dangerous persons. The nodular type is that of the infective cases, yet they feel well and continue their work, and during the reactionary stage of the disease they shed innumerable bacilli from their skins and ulcerated oro-nasal mucous membrane.

Early leprous lesions have never been found in the gastro-intestinal tract below the pharynx, which tells strongly against oral infection. The first noticed lesions in over 1,000 Indian asylum cases were chiefly on the extensor surfaces of the limbs, and in hilly regions frequently on the feet, and more still on the face, indicating direct infection through the skin of areas uncovered by clothes, a moist hot climate predisposing to infection as ROGERS showed. The promiscuous use of bedding favours house infections in India. There is presumptive evidence that, as in tuberculosis, a comparatively small proportion of those infected ever develop the disease owing to natural immunity. Voluntary segregation of infectious bacteriologically positive cases is advocated.

Prophylaxis.—Muir therefore suggests as the most effective way of reducing leprosy the opening of out-door dispensaries in all provincial towns in all endemic areas under trained workers, for the treatment of early cases, advanced disfigured patients not being admitted, leprosy being even more suitable than tuberculosis for such treatment. Infections are mainly house ones in persons up to 20 years of age, and only 11 per cent. were attacked when over 40, conjugal infections being only 2·9 per cent. In 58 per cent. previous contact with lepers was traced, chiefly with infected parents or grandparents.

L. Rogers.

CHINA MEDICAL JOURNAL. 1923. July. Vol. 37. No. 7. pp. 562-567.—**The Diagnosis of Leprosy.**

This is a reprint of a pamphlet by Dr. E. MUIR, Leprosy Research worker of the Calcutta School of Tropical Medicine. After pointing out that the ignorant public fluctuate between panic on hearing of leprosy and indifference regarding contact with lepers, the importance of early diagnosis, to allow of rapidly efficient treatment, is emphasized. Diagnosis depends either on finding the lepra bacilli in the deeper layers of the skin (obtained by removing a portion of the whole thickness of the skin from a non-anaesthetic patch and staining smears from it); on or demonstrating the anaesthesia of the skin in the ordinary way. Other subsidiary signs are deep analgesia, loss of thermal sense, hyperaesthesia preceding anaesthesia, depigmentation, erythematous patches (often the first sign), thickening of the superficial nerves (ulnar, peroneal, great auricular, radial and external saphenous nerves in that order of frequency), parakeratosis, anhydrosis, and interfollicular swelling (due to leprous infiltration of the skin between the hair follicles). The skin lesions have to be differentiated chiefly from syphilis, psoriasis and tinea; and the nerve cases from syringomyelia (in which loss of sensation to light touch is not an early or important symptom); and lung leprosy (in which large bundles of lepra bacilli may be found and the disease clears up more readily under treatment) may have to be distinguished from pulmonary tuberculosis, although rarely both may exist together. Leprosy may also co-exist with syphilis, hookworm, malaria, etc., and these must be treated if the leprosy is expected to improve.

L. R.

GOMEZ (Liborio). [In English and Spanish.] **The Question of the Initial Lesion of Leprosy. El problema de la lesion inicial de la lepra.**—*Jl. Philippine Islands Med. Assoc.* 1923. Sept.-Oct. Vol. 3. No. 5. In English, pp. 227–229. In Spanish, pp. 263–265.

The first noticed manifestation of leprosy in 100 cases was numbness in 52, cold sensation in 1, red spots on the face in 16, and on the lower extremity in 9; white spots in 11 (half being on the face), nodules in 5, nasal lesions in 2, and miscellaneous in 4. Nervous manifestations were therefore most frequent, while multiple spots not rarely appeared at the same time, so it is not considered possible to point to any particular lesion as certainly the site of entry of the bacillus. Primary nasal lesions were rare.

L. R.

ANDŌ (Nihei). [**Klinische, bakteriologische und serologische Studien ueber Lepra.**]—*Fukuoka Ikw. Daig. Z.* 1921. Vol. 14. pp. 123–194. [Summarized in *Japan. Jl. Med. Sciences.* Tokyo. 1922. Vol. 1. No. 3. p. 260.]

273 specimens of the skin from 146 lepers were examined. The author disagrees with the present classification of cases, and prefers to divide leprosy into three stages similar to those of syphilis and tubercle. He found 8 species and 35 subdivisions of the lepra bacillus, which could be arranged in four main groups. He also carried out complement fixation experiments using leprosy bacilli and calf's heart-muscle as antigens.

L. R.

ROGERS (L.). **The Present Position of Leprosy Prophylaxis.**—*Jl. State Med.* 1923. Dec. Vol. 31. No. 12. pp. 569–584.

This paper begins with a rapid review of the present world-incidence of leprosy, especially as regards its correlation with humidity and temperature, a summary of the fuller account by the author which appeared in a recent issue of the *Transactions of the Royal Society of Tropical Medicine and Hygiene.* Other conditions tending to favour the spread of the disease, such as promiscuity, backward civilization, education and general hygiene, are then briefly dealt with. Very interesting figures are given to prove the greater susceptibility of the young and the effects of close contact, particularly with cases of the nodular form. The whole problem of prevention of spread may be summed up in avoidance of contact between lepers and susceptible healthy individuals, a matter less easy of accomplishment than would appear on a superficial view, for it embraces several problems, such, for example, as the detection of cases in an early stage, and patients will naturally conceal the disease if they think that to declare it will entail forced separation from their relatives and friends. This attitude will only be overcome if they can look with a fair degree of hope towards a cure of their condition.

Instances are given of the good effects which have resulted from measures of segregation properly carried out in various countries, such as Norway, Sweden, Iceland, Eastern Canada, etc. A most instructive contrast is afforded by Hawaii. In 1865 a segregation law was passed and a settlement started at Molokoi, but the law was allowed to become a dead letter and the incidence remained little, if at all, affected. During the first 29 years of American control, with more stringent enforcement of the law, the rate per mille was reduced from 13·5 to 2·16, or less than one-sixth. Several of the British possessions are mentioned to illustrate the results of isolation and segregation when properly enforced and when carried out half-heartedly. In India the incidence rate has been reduced by half in the last 50 years, although even in 1921 only 7·7 per cent. of the known lepers were isolated ; in 1911 the figure was 4·7. A great advance in the method of dealing with the leprosy question in India will be gained if the proposal to include in the leper colonies one section for the treatment of advanced and maimed cases in hospital, another for the " cottage " treatment of earlier cases, and a third for healthy children of lepers, is brought to a successful issue. In Ceylon, where segregation is inefficiently carried out, there has been practically no improvement.

Jamaica and Trinidad provide an instructive comparison. In the former segregation enforced has brought about a steady reduction, so that the incidence rate is less than half what it was 30 years ago, and " leprosy is now a rare disease," In the latter, measures are inefficiently carried out ; compulsory segregation with insufficient accommodation and a system which does not prevent a considerable number of cases " absconding " have resulted in a steady increase in the incidence rate. The establishment of a Federal Leper Colony, as suggested by the Leprosy Commission of 1919, should ameliorate these conditions. Africa, more particularly South Africa and the Tanganyika Territory, is showing some degree of improvement since the matter was seriously taken in hand ; prior to that time (1921) only a small proportion of those in an advanced stage of the disease was isolated and there had been a steady increase in incidence, as in all places where measures are formulated but not enforced. The ideal methods of prophylaxis consist of (1) Compulsory notification of cases by medical men and householders ; (2) Compulsory segregation ; (3) Detection of early cases by periodic examinations ; (4) Prohibition to lepers of certain trades connected with food, clothing, etc. ; (5) Removal of children of leper parents as soon as possible after birth ; (6) Control of immigration.

This paper is a mine of information, and should be studied by all men practising in countries where the disease occurs. Space precludes even a mention of more than a few of the points dealt with.

H. Harold Scott.

GARCIA MEDINA (Pablo). **Profilaxis y estadística de la lepra en Colombia.** —*Gac. Med. de Caracas.* 1923. Feb. 28. Vol. 30. No. 4. pp. 56–59.

A most interesting paper. The author affirms that the number of lepers in Colombia recorded in American and European books, namely 20,000, is far in excess of the actual number, which is between 6,000 and 7,000. The law relative to notification is very strict, so that it is improbable that the total exceeds appreciably the official returns of 6,568, or about 1 per 1,000 of the population.

As far as possible, segregation is carried out on the colony system. 5,440 (or 79 per cent.) are thus dealt with in the lazarettos; 2,271 [the figure is given elsewhere as 2,771, but the lower is probably correct] at the "colony" of Agua de Dios; 2,456 at that of Contratación; and 213 at Caño de Loro, situated on a small island in the Atlantic.

By the colony system the patients live as nearly as possible a normal life, civically, socially and industrially. There are magistrates, police, a municipal council, and so forth. Well-staffed and well-equipped hospitals and schools are provided, entertainments and recreation arranged for, and land allotted for cultivation. Each colony has its own metal money which is valueless elsewhere.

As regards the type of disease, 60 per cent. are of the nodular variety, 30 per cent. of the nervous, and 10 per cent. mixed. The idea that leprosy is a poverty disease is controverted in Colombia; the majority of sufferers are agricultural labourers who earn good wages, and the disease is more prevalent in rural districts than in towns. The influence of climate is noted. The incidence is greatest (55·9 per cent. of the whole) where the mean annual temperature is between 20° and 24° C. and the relative humidity is high; next to this are districts with a temperature between 25° and 28° C., or 14° and 18° C. Warm and dry areas with a temperature of 29°-32° C., or cold districts (8°-12° C.) present the fewest cases.

In the matter of treatment good results were obtained temporarily by the use of atoxyl in doses of 30-50 cgm. daily, and by sodium salicylate or methyl salicylate. The amelioration, however, was not maintained and these forms of treatment have been largely superseded by chaulmoogra oil.

Intravenous injections of sodium gynocardate did not yield satisfactory results. 350 patients have been treated with the ethyl esters of chaulmoogra with marked benefit.

H. Harold Scott.

RUTOWITCZ (Bernardo Leibowitz). **Tratamento e prophylaxia da Lepra.**—*Sciencia Medica.* Rio de Janeiro. 1923. Oct. 31. Vol. 1. No. 4. pp. 173–180.

During the twelve months ending June 1923, there were 526 new admissions to the Institute for the Treatment of Leprosy, Pará. 298 were definite cases of the disease and 228 were admitted for observation. Of the 298 there were 83 of the tuberculous form, 201 of the anaesthetic, and 14 mixed. The treatment adopted was chiefly that of Heiser, chaulmoogra oil in camphorated oil, but intravenous injections of hydnocarpate of sodium and the ethylic esters of chaulmoogra oil were used for some cases. Detailed records were kept of the history, symptoms, treatment and progress of each patient. The main drawback of Heiser's treatment is the development of local abscesses, attributed to the action of resorcin contained in the preparation employed. Persistence in treatment is essential. Thus, one patient on admission showed atrophy of the hands and loss of tactile sense, a macular patch on the forehead, thickening of the ulnar nerve, inguinal adenitis, commencing deformity of the ankles, loss of hair, etc. During the ensuing 18 months he was given 150 injections, and at the time of writing "all has disappeared: the patient has the aspect and sensation of a healthy individual"

H. Harold Scott.

PUBLIC HEALTH REPORTS. 1923. Aug. 10. Vol. 38. No. 32. p. 1817.—**Paroled Lepers from Kalihi Hospital, Hawaii.**

Derivatives of chalmoogra oil have been used since July 1916, and mixed esters since July 1919. Between 1912 and 1917, 34 lepers were paroled, or a yearly average of 5·7, 10 were set free in 1917, while from 1918 to 1922 no less than 193 were paroled, or a yearly average of 48 2. Up to June 30th 1923, 44 paroled cases had returned to hospital, 7 of whom had been paroled again.

L. R

WADE (H. W) & BASA (Jose Avellana). **The Culion Leper Colony.**—*Amer. Jl. Trop Med.* 1923. Sept. Vol. 3. No. 5. pp. 395–416. With 2 plates. [1 ref.], & *Monthly Bull. Philippine Health Service.* 1923. Mar. Vol. 3. No. 3. pp. 93–103.

The interest aroused in the treatment of leprosy by investigators in India and Hawaii led the Philippine authorities to grant appropriations for extending the work to the Culion Colony in 1921, and the work was expanded on the arrival of Governor-General WOOD in 1922. This paper gives an interesting account of the history of the colony as a preliminary to subsequent reports. It is too long to be easily summarized, and should be read by all interested in the subject.

L. R

i. MARSHALL (Edward R.). **What the United States Public Health Service is doing to prevent the Spread of Leprosy in the Continental United States.**—*Milit. Surgeon.* 1923. Oct. Vol. 53. No. 4. pp. 313-320.

ii. OLIVER (THOMAS). **A Visit to a Leper's Colony.**—*Lancet.* 1924. Jan. 5. p. 57.

i. After two-score years of persistent efforts Congress passed "an act to provide for the care and treatment of persons afflicted with leprosy and to prevent the spread of leprosy in the United States," and provided funds for the purpose, but the difficulty of finding a site was only solved when the Louisiana Leper Home at Carville was taken over in January 1923. It soon contained 172 lepers, 100 more are awaiting accommodation, which is now being supplied, while the total numbers in the United States are estimated at fully 1,000. Comfortable conditions, good treatment, land for cultivation, and amusements are provided, making the settlement a model one.

ii. This paper describes a brief visit to the Carville Colony.

L. R.

MEIRELLES (E.). [**Leprosy in Children.**]—*Arch. Latino-Amer. de Pediatria.* Buenos Aires. 1923. Apr. Vol. 17. p. 250. [Summarized in *Jl. Amer. Med. Assoc.* 1923. Aug. 4. Vol. 81. No. 5. pp. 426–427.]

Of 116 cases of leprosy in children seen in 21 years in Rio de Janeiro only 3 were infants and 6 were between 2 and 6 years of age. All were from contagion, none were congenital cases, which seem to be extremely rare.

L. R.

JEANSELME (M. E.). **Sur un cas de lèpre contractée à Paris.**—*Bull. Acad. Méd.* 1923. Dec. 18. Year 87. Vol. 90. 3rd Ser. No. 43. pp. 595–597. [3 refs.]

A young man developed macular leprosy of a typical and extensive nature with some thickening of the nerves, although he had been born and lived all his life in Paris. His mother was healthy ; his father had served in French Guiana and in Tonkin and Cochin China from 1891 to 1905, but was free from the disease on returning to Paris in the latter year. The son was born in 1907 when his father was still free from signs of leprosy, which first appeared on the face of the father in 1913, eight years after he left the endemic areas of leprosy. Lepra bacilli were found in the nasal mucus of both, and it is extremely probable that the son contracted the disease while living in the house of his affected father in Paris. In spite of the commonly held opinion that the disease is not infectious in the temperate zone, three other cases of apparent infection in non-endemic areas of France have been reported in recent years. The author therefore requested that the permanent leprosy commission of the Academy of Medicine should study the prophylactic measures necessary to prevent the propagation of leprosy in France, as he estimated the number of lepers in Paris at the present time at 150 to 200.

L. R.

FERNANDO (Antonio S). [In English & Spanish.] **Ocular Manifestations in Leprosy as observed at Culion, P.I. Las manifestaciones oculares en la lepra observadas en Culion, P.I.**—*Jl. Philippine Islands Med. Assoc.* 1923. Sept.-Oct. Vol 3. No. 5. In English. pp. 230-236. With 3 figs. In Spanish. pp. 266–270. [3 refs.]

The author has studied the ocular lesions in the Culion settlement, and points out their occurrence in increasing numbers with duration of the disease, the proportion of such complications in 400 cases varying from 95 per cent. in advanced cases of 15 years' duration to 21 per cent. among those of 8 years' duration. Patients showing involvement of the adnexa, eyebrows and eyelids numbered 178, and of the eye-ball 125, iritis (29) and keratitis (21) being the most common lesions. Blindness of one eye was seen in 23 and in both in 9, with an average duration of leprosy of 14 years. Great care in the administration of chaulmoogrates is necessary when inflammatory eye-symptoms are present for fear of reactions endangering sight.

L. R.

SUGAI (Takekichi). **[Ueber die Lepra der Schleimhaut der Mundhöhle.]** —[Leprous Lesions of the Oral Mucosa.]—*Hifu Hitsunyoki Z.* Tokyo. 1921. Vol. 21. pp. 228–242. [Summarized in *Japan. Jl. Med. Sciences.* Tokyo. 1922. Vol. 1. No. 3. pp. 259–260.]

A study of four lepers showed on the tongue superficial small nodules, in the throat small soft smooth pustules with slight infiltration, and in the nose and larynx as well as in the salivary glands many lepra bacilli. The tonsils were often affected in advanced cases, but the lower part of the trachea and the alimentary canal were always free from lesions.

L. R.

WALKER (Ernest Linwood), MACARTHUR (Charles G.) & SWEENEY (Marion A.). **Second Progress Report on the Investigation of the Chemotherapeutics of Chaulmoogra Oil and its Derivatives in Leprosy and Experimental Tuberculosis.**—*Collected Reprints from the George Williams Hooper Foundation for Medical Research.* No. XVI. 1922–1923. Vol. 7. Reprinted from *Trans. 18th Ann. Meeting Nat. Tuberculosis Assoc.* pp. 553–561. [1 ref.]

This paper records interesting biochemical investigations on the absorption of derivatives of chaulmoogra oil by means of a test the authors devised with the aid of the polariscope, enabling amounts as small as one milligram to be detected in the tissues. They found that butyl and propyl esters were less irritating to the tissues than ethyl esters, and that in whatever form chaulmoogric acids are administered they are metabolized like ordinary fats after the compounds have been hydrolyzed. They are well absorbed from the alimentary tract, but disturb the stomach, and are more quickly absorbed by the intramuscular than by the subcutaneous route, and roughly in proportion to the dose. When injected into the blood they disappear from the circulation in a few minutes and they do not penetrate tubercular tissues in demonstrable amounts, being rapidly oxidized in the system. If repeated large doses are injected, the drug accumulates in the liver. It is more toxic by the intravenous method. The therapeutic experiments on tuberculosis in rabbits are not yet completed, but the present indications are that their action is slight, if any, being less active against the tubercle bacillus in vivo than in vitro.

L. R.

WADE (H. W.). [In English & Spanish.] **Preliminary Notes on Results of Leprosy Treatment at Culion Leper Colony. Notas preliminares sobre los resultados del tratamiento de la lepra en la colonia leprosa de Culion.**—*Jl. Philippine Islands Med. Assoc.* 1923. Sept.-Oct. Vol. 3. No. 5. In English, pp. 236–241. In Spanish, pp. 270–275.

This valuable paper from the Culion Settlement deals with by far the most extensive trial yet carried out of the improved treatment of leprosy. Prior to May 1st 1921 the staff was insufficient to enable any but concurrent affections among the 4,500 lepers to be treated, but it was then strengthened by four physicians, and 500 cases were examined carefully in the next two months as a preliminary to regular treatment. Intravenous injections of ROGERS's preparations were soon dropped owing to vein troubles, and chaulmoogra ethyl esters, plain or iodized, were given intramuscularly. By April 1922 the number had been gradually increased to 1,500 cases, and in the following year to 4,067.

which had been treated for variable periods of time. A survey on September 30th 1923 showed improvement in 55·9 per cent., while in 36 per cent. more the progress of the disease had been checked, 6·4 per cent. were worse, and 1·7 per cent. had died, and under the circumstances "it is felt that this result is far from discouraging." The Mercado-Heiser group gave 37 per cent. improved, plain morrhuic ethyl esters 34 per cent. improved of 44 cases, and the same drug iodized 45 per cent. improved out of 80 cases. Females improved more than males, and the age groups of 20, 40 and 60 years improved more than those of 10, 30 and 50 years of age, especially females of 50, which variations are attributed to the disturbing influence of sexual activity from 20 to 30 and the menopause about 50. Cases of one to two years' duration showed most improvement, after which there was a steady decline. Still more important is the time under treatment as shown in the following figures, which are most encouraging:—

Time under treatment.	Under 3 months.	3–6 months.	6–9 months.	9–12 months.	12–15 months.
Percentage improved	26%	42%	74%	81%	93%

The further progress of this crucial test will be awaited with much interest, as the above results suffice to establish the great advantages of the new principle of injecting soluble products of chaumoogra and other oils.

L. R.

LARA (C. B.). [In English and Spanish.] **Observations on Clinical Aspects of Leprosy Treatment at Culion Leper Colony. Observaciones sobre los aspectos clinicos del tratamiento de la lepra en la colonia leprosa de Culion.**—*Jl. Philippine Islands Med. Assoc.* 1923. Sept.-Oct. Vol. 3. No. 5. In English, pp. 241–247. [5 refs.] In Spanish, pp. 275–280.

This paper deals with the clinical aspects of the Culion treatment and brings out the following points. The intramuscular injections of ethyl ester chaulmoograte were usually given once a week in doses beginning with 0·5 cc., increased by 0·5 cc. at a time up to 4 or 5 cc., reduced or temporarily suspended if much reaction occurs. In early cases the lesions may recede or nearly disappear in about three months; in moderately advanced ones in three to six months, the lesions becoming swollen and inflamed and apparently worse for one to three weeks and then noticeably shrinking, or occasionally ulceration followed by healing may take place. In advanced cases of the nodular or mixed type very little change is usually seen after six months, while not a few appear to be worse. In nerve cases a few show improvement, but advanced cases as a rule remain stationary for months, and the disease may even progress. In some cases the improvement is not sustained. In cases complicated with tuberculosis great caution is required, as in 275 cases all showed symptoms leading to suspension of the drug, while 31 per cent. are believed to have been permanently injured; the symptoms were less under ethyl morrhuate. The deaths from tuberculosis in the colony increased during the past year, but had rapidly increased during recent years, 20 to 30 per cent. of the lepers being tuberculous, while the ratio of deaths from this complication to the total deaths has increased from 1 to 4 in 1915 to 1 to 2 in the first six months of 1922, partly due to better diagnosis, autopsies being done only since 1922. Nephritis also appears to be increasing, especially due to secondary infections in ulcerated cases. Hookworm disease is also prevalent, and it has not yet been possible to carry out a campaign against it. The author concludes that " both impressions of the staff and patients and the statistical data indicate that the treatment is, on the whole, productive of much benefit, and is distinctly promising in those cases that are not too advanced or are too badly affected by complications for marked or permanent relief to be expected."

L. R.

MUIR (E.), assisted by LANDEMAN (E.), ROY (T. N.) & SANTRA (I.). **The Treatment of Leprosy in the Light of the Nature of its Spread through the Body.**—*Indian Jl. Med. Res.* 1923. Oct. Vol. 11. No. 2. pp. 543–578. With 14 figs. and 2 charts. [2 refs.]

This valuable paper records Dr. Muir's Calcutta researches on the treatment of leprosy, and brings out clearly the necessity of considerabl experience and careful attention to detail if the best results are to be obtained. The principles underlying the treatment are the necessity of strengthening the body resistance and inducing repeated small reactions due to breaking up and setting free the bacilli in the tissues, which must be carefully controlled to prevent their being excessive, and of avoiding passive congestion in the lesions. A rise of temperature may be beneficial; a case in which the onset of kala azar cleared up the leprotic lesions is mentioned. Exercise strengthens the body, enabling it to destroy the bacilli and assist the cure, and also prevents capillary congestion. Cases complicated with syphilis or with a strong Wassermann reaction should be also treated for this disease, hookworms should be expelled and the general health maintained. Without attention to these points the specific treatment is not nearly so effective.

Ethyl esters prepared from chaulmoogra, hydnocarpus, olive, linseed, cod-liver, neen and gurjum oils have been injected by various routes, the subcutaneous or intramuscular being generally used; the addition of an equal quantity of olive oil greatly diminishes the pain due to those methods of administration, while the addition of 4 per cent. creosote is advised, except when the drug is sterilized in ampoules. Improvement appears to be dependent on obtaining reactions, even if only slight ones, with swelling and softening of the nodules, which in nerve cases may cause severe pain requiring morphia, the benefit appearing to result from the circulation of bacilli or their toxins thus set free. Control injections of creosote and olive oil produced little benefit, showing that the specific effect was due to the ethyl ester hydnocarpate. The use of ethyl esters of linseed and olive oil gave rather better results than those of hydnocarpus and chaulmoogra oils, but the number of cases was too few to establish fully this important point. In eight leper asylums trials of the hydnocarpate esters in 179 cases showed 31 worse, 41 stationary, 48 slightly improved, 58 much improved, and in 3 all signs disappeared, but in many cases the duration of the treatment was insufficient. At Dichpali, where special care was taken, no less than 66 per cent. showed " much improvement " or " all signs disappeared," 12·5 per cent. falling into the latter class, showing the necessity of skilled individual attention. Injections of the hydnocarpate esters into the skin lesions caused the most rapid improvement, which so impressed the patients that they put up with the pain. The first dose by either method should be only 0·25 cc. and it is advisable to take the temperature four times daily, so as to regulate the rapidity of the increase of the doses by the reactions observed. The drug is injected intramuscularly, and the doses are increased according to the tolerance of the patient, some standing as much as 6 to 7 cc. twice a week. If 2 cc. doses, intramuscularly, fail to produce reactions, divided doses should be injected beneath the lesions, of the skin or nerve, but not into the nerves. If a patient loses weight after reactions stop the drug for one or two weeks. In initial lesions the doses may be rapidly increased, but when there are extensive bacillus-containing lesions greater caution is necessary, so as not to break up and set free too many bacilli at a time. In some cases the injection of a vaccine of Kedrowsky's acid-fast bacillus may be beneficial. Antimony, arsenic and iodides have also been tried, but it is too early to report on them.

The prognosis depends on the age of the patient, his digestive powers, habits regarding exercise, mental attitude and the duration of the disease. Muir concludes that early and persistent treatment arrests the disease and causes gradual disappearance of its signs and symptoms, although he does not consider that a specific cure has yet been discovered; treatment should be continued long after the skin and mucous membranes have become free from bacilli.

L. R.

CHINA MEDICAL JOURNAL. 1923. July. Vol. 37. No. 7. pp. 572–576. With 1 text fig.—**The Treatment of Leprosy by the Infiltration Method.**

This is a reprint of a pamphlet issued by Dr. E. Muir from the Calcutta Leprosy Research Department, describing the method of injecting his E.C.C.O. mixture into the dermal lesions of leprosy. The needle of the syringe is inserted as far as it will go in different directions from punctures made at opposite edges of the patch, and as it is withdrawn drops of the mixture are injected so as to filtrate the loose subcutaneous tissue of the whole patch. This is done twice a week or oftener as long as no marked reaction is produced. The mixture contains 1 to 2 cc. of the ester, 0·5 gram camphor, 0 5 cc. of double distilled creosote, and 3 cc. of olive oil free from fatty acids, the olive oil being sterilized by heating to half an hour on a water bath before being added. The drug is absorbed more rapidly than by ordinary injection, and produces general as well as local improvement; only slight pain at the time of injection results, and the more rapid improvement of the treated areas encourages the patient.

L. R.

BIELING. **Chemotherapie und innere Desinfektion. II. Lepra und Tuberculose.**—*Deut. Med. Woch.*, 1923. Sept. 21. Vol. 49. No. 37–38. pp. 1214–1216. [43 refs.]

This paper consists mainly of a theoretical discussion of the principles of chemotherapy as applied to leprosy and tuberculosis, suggested by recent work on the former disease. After referring to the use of "antileprol" by ENGEL in Cairo in 1909, he goes on to discuss DEAN's work on ethyl ester chaulmoograte and quotes the following interesting figures regarding MCDONALD's results in the Philippines. Out of 142 cases in which treatment was begun on January 2nd 1918, by October of the same year 7 had died, while 94 were cured, none of the latter having relapsed in 1921, so that a large number of cases had remained well for 2 to 3 years. The drug was usually well borne, although 10 per cent. could not take the injections regularly. Propyl and butyl esters gave rise to no trouble and the results were equally good.

L. R.

ENGEL (Fr.). **Die Behandlung der Lepra mit dem Äthylester des Chaulmoograöls.**—[Treatment of Leprosy with Ethyl Esters of Chaumoogra Oil.]—*Arch. f. Schiffs- u. Trop.-Hyg.* 1922. July. Vol. 26. No. 6. pp. 161–164. [2 refs.]

With reference to DEAN'S work on the use of ethyl ester chaulmoogrates in leprosy, it is pointed out that this preparation was formerly made by Bayer's firm under the name of "antileprol" and used with beneficial results in 60 lepers, as reported in 1909 at the Bergen International Leprosy Conference and in subsequent papers.

L. R.

HUIZENGA (Lee S.). **Note on the Treatment of Leprosy.**—*China Med. Jl.* 1923. July. Vol. 37. No. 7. p. 567.

The writer reports favourable results in leprosy with weekly injections of the mixed ethyl esters of chaulmoogra oil made in the Pekin Union Medical College. He points out that a series of patients, who were given plenty of wholesome food in addition to the drug, did better than those treated without that advantage.

L. R.

HAGMAN (G. L.). **On the Treatment of Leprosy with Dean's Derivatives of Chaulmoogra Oil.**—*China Med. Jl.* 1923. July. Vol. 37. No. 7. pp. 568–571.

Six patients undertook to undergo a year's treatment; the one who continued for the full year became clear of symptoms and bacteriologically negative, while improvement was obtained in other cases after shorter courses.

L. R.

TIETZE (Samuel). [In English and Spanish.] **Antileprotic Treatment as instituted at San Lazaro Hospital. Tratamiento antileproso empleado en el hospital de San Lazaro.**—*Jl. Philippine Islands Med. Assoc.* 1923. Sept.-Oct. Vol. 3. No. 5. In English, p. 247. In Spanish, p. 281.

This is a very brief report on treatment at the San Lazaro Hospital of Manilla by ethyl chaulmoograte intramuscularly. Reactions were noted in 10 per cent., encouraged by exercise; 300 cases were treated. No information is given regarding the results obtained.

L. R.

ORTIZ (Pedro N.). **La lepra y su nuevo tratamiento.** [New Methods of Treatment of Leprosy].—*Bull. Porto Rico Med. Assoc.* 1923. Mar. Vol. 17. No. 141. pp. 27–39. With 27 plates.

Intramuscular injections of the ethyl esters of chaulmoogra prepared in the Chemical Laboratory of the University of Hawaii were administered to 40 patients. Nine improved markedly and in three of these all the signs disappeared. Eleven showed slight amelioration only, while thirteen remained in the same condition as at first. Eight of these last were suffering from the nervous type, and it is clear that when there are paralytic lesions and deformities a marked degree of improvement is not to be expected. The disadvantages of these injections are: great pain, severe local reaction leading to the formation of abscesses, and a rise of temperature to 38°–40° C. continuing perhaps for 8 to 12 weeks. In seven of this series the treatment had to be suspended, owing to these causes or to intolerance of the drug, for periods varying from 4 to 29 weeks. If well borne the injections are given in doses of 3 gm. twice a week.

Intravenous injection of the combined ethyl esters was also employed, beginning with 25 cgm. weekly and increasing each time by the same amount to a maximum of 3 gm.; this appeared to be the limit of tolerance. Shivering, rise of temperature, and a troublesome dry cough often followed, the last being prevented by a dose (0·015 gm.) of heroin ten minutes before the injection. Six patients received two doses weekly of 3 gm., and thirteen one dose. The author remarks on the rapid amelioration following this form of treatment and intends to use it more frequently and in larger doses.

H. Harold Scott.

HAMZAH (Mohamad). **Thymol-injecties tegen Lepra.** [Thymol Injections against Leprosy.]—*Geneesk. Tijdschr. v. Nederl.-Indië.* 1923. Vol. 63. No. 5. pp. 732–733.

This is a short preliminary note recommending intramuscular injections of 10 per cent. thymol in cod-liver oil, 4 cc., every three days at the beginning, later on once a week. The author reports very favourable results of this treatment.

W. J. Bais.

HAMZAH (Mohamad). **Ueber Behandlung der Lepra mit Thymol. Vorläufige Mitteilung.** [Treatment of Leprosy with Thymol. Preliminary Communication.]—*Klin. Woch.* 1923. Oct. 15. Vol. 2. No. 42. p. 1963.

Observations on the treatment of 14 cases of leprosy with thymol 10·0, cod liver oil 90·0 are recorded, 4 cc. being injected intramuscularly every fourth day for the first month, and then once a week. The author was led to try this by using thymol in the place of carbolic acid as an antiseptic added to sodium morrhuate, when he noted definite improvement after two injections, although without the thymol no improvement had taken place, the patient now becoming able to take up work. In other cases the thymol injections were followed by evident and rapid improvement, the nodules becoming flatter and paler, followed by pigmented scarring, but they eventually became white. In some cases reappearance of the eyebrows and hairs on formerly anaesthetic patches, and regrowth of a finger nail were noted, a claw hand regained power, perforating ulcers healed after two injections, as did those on the legs. A fuller report is promised later.

L. R.

HEGGS (T. Barrett). **A Note on the Treatment of Leprosy.**—*Brit. Med. Jl.* 1923. Dec. 29. pp 1253–1254.

A nine months' trial of oscol and colloidal antimony at Bagdad is reported in fifteen bacteriologically positive cases, with distinct improvement in most cases up to about three months, when it came to a standstill before the nodules or bacilli had disappeared. Similar temporary improvement followed intravenous injections of chaulmoogra oil and ether. An occasional case improved greatly.

L. R.

NOEL. **Traitement de la lèpre par les sels de terres rares.**—*Ann. de Dermat. et de Syph.* 1922. Oct. 6th. Ser. Vol. 3. No. 10. pp. 475–494.

In view of the reported value in surgical forms of tuberculosis of the salts of rare earths of the group " cerium " prepared in the laboratories of FOURNIER, ROBERT and CARRIÈRE, Noel in Cameroon has tested their value in 7 cases of leprosy by the intravenous method, giving 8 to 10 cgm. doses in a 2 per cent. solution daily for 20 days, repeated with intervals of 15 to 20 days up to six series, in all 120 injections, in the course of eight months. In two cases distinct improvement took place, although far from complete resolution ; in 4 the condition remained stationary ; while in 1 the lesions increased considerably in spite of the treatment ; the results not being satisfactory on the whole.

L. R.

i. PHIPPS (F.). **A propos du traitement de la lèpre par l'Eparseno. Purpura aigu hémorragique provoqué par le traitemente.**—*Maroc.-Médical.* 1923. June 15. No. 18. pp. 176–178. [1 ref.]

ii. DELAMARE (G.) & ACHITOUV. **Lèpre mixte éparsénorésistante.**—*Bull. Acad. Méd.* 1923. Dec. 4. Year 87. Vol. 90. 3rd Ser. No. 41. pp. 488–492. With 1 chart in text.

i. The author reports a case of nodular leprosy in which the use of eparseno, as advised by J. HASSON and by GOUGEROT (this *Bulletin*. Vol. 20, p. 164), not only failed to benefit the disease, but gave rise to a serious intoxication complicated by acute purpura and severe haematemesis.

ii. After referring to the success of HASSON, GOUGEROT, ABERASTURY and BALINA, CHARTRES and ROBINEAU with eparseno in leprosy, and the failures of HUDELÓ and RICHON, JEANSELME, MARCHOUX and PHIPPS, the author records a case of nodular leprosy in which during two months' treatment with a total of 30 cc. of the drug the reactions obtained were not followed by absorption of the lepromata or other benefit, while the patient lost 10 kilos. in weight.

L. R.

KRAUS (R.). **Beitrag zur Vakzinetherapie der Lepra, Vorgetragen am intern. Leprakongress in Rio de Janeiro.**—*Wien. Klin. Woch.* 1923. Nov. 15. Vol. 36. No. 46. p. 812.

This paper is a preliminary report on a trial of vaccines of Duval's, Devcke's and Kedrowsky's bacilli killed by ether in the treatment of leprosy in South America. Emulsions in physiological salt solution in doses of 50, 100, 500, & 1,000 millions were injected every 4–6 days. Professor SOMMER first used it, but gave it up on account of the severe reactions. During the last year Dr. SCHRODER tried it in the infectious hospital and found the reactions to vary from local inflammation or suppuration, through mere infiltration of the tissues to no reaction at all, while in some there was a rise in temperature. In anaesthetic forms they noted frequent return of sensation, while the bacilli disappeared from the nose, and improvement was noticed in all three types of the disease. Although he is not yet prepared to give a definite opinion, he thinks the method promising. Some other medical men report not unfavourably.

L. R.

WALKER (Ernest Linwood). **Contributions to the Bacteriology of Leprosy. II. The Chromogenic Acid-fast Bacillus of Clegg.**—*Amer. Jl. Trop. Med.* 1923. Sept. Vol. 3. No. 5. pp. 417–424. [9 refs.]

Cultures were first made from swabs of nasal or shin lesions containing many lepra bacilli on Musgrave and Clegg's medium (which, consisting essentially of agar and water, is of very low nutrient value) in symbiosis with amoebae and cholera vibrios. In a small percentage acid-fast bacilli developed after several weeks, and were easily subcultured. Similar results were obtained on the same medium in the absence of the symbiotic organisms, and similar acid-fast bacilli were obtained free from diphtheroids on transplanting from the primary colonies of the pleomorphic partially acid-fast diphtheroid of Bordoni-Uffreduzzi into Musgrave and Clegg's medium, and again on transplanting the smegmal diphtheroid on to the same medium. Further, a non-chromogenic acid-fast bacillus differing from Clegg's bacillus was obtained from non-leprous nasal secretions. The author therefore concludes that Clegg's bacillus appears to be a developmental stage of Bordoni-Uffreduzzi's diphtheroid, but it may possibly be a contamination, and " this organism appears to be identical with or very closelv allied to the pleomorphic and facultative acid-fast so-called Bacillus smegatis."

L. R.

TAMIYA (Sadasuke). [**A Morphological and Biological Study of** *Bacillus leprae.*]—*Okayama Ig. Kw. Z.* 1921. pp. 633–662. With 1 plate. [Summarized in *Japan. Jl. Med. Sciences.* Tokyo. 1922. Vol. 1. No. 2. p. 162.]

" The author found that *Bacillus leprae* can be proliferated to a certain extent in the phosphoric acid glycerin broth, when inoculated with small pieces of leprous tissues. The cultured bacilli take certain periodical changes, which can be repeated in the same medium. One course takes about 30 days. The changes are, a large bundle shaped agglomeration of the bacilli as is seen in the initial stage of the culture of tubercle bacilli, which gradually assumes a normal form, and then diphtheroid form, and then a short wedge-form, and then again assumes a large cluster as in the beginning. During the entire course of the cultivation the bacilli always maintain acid fastness. In a potassium cyanate broth medium, the bacilli assume a remarkable granular appearance, and all the forms, including the granular, that are found in the medium take a deep stain by *Ziel's* solution. The straight granular form will be seen to set free the granules, and the bacillary bodies that had set free those granules contain a vacuole, and present something like a sporogenic form."

L. R.

i. KUJO (Koretake) & CHUMA (Masaru). [**Histologische Studien ueber Lepragewebe mittelst vitaler Färbung.**] [Vital Staining in the Study of Leprous Tissues.]--*Osaka Ig. Kw. Z.* 1921. Vol. 20. pp. 1214–1232. With 1 fig. [Summarized in *Japan. Jl. Med. Sciences.* Tokyo. 1922. Vol. 1. No. 1. pp. 67–68.]

ii. KUJO (Koretake). [**Leprazellen und vitale Färbung.**]—*Tokyo Ij. Shsh.* 1921. pp. 795–802. [Summarized in *Japan. Jl. Med. Sciences.* Tokyo. 1922. Vol. 1. No. 1. p. 68.]

i. Sodium carmine and indian ink were injected into lepra nodules during life. The epithelial cells and the giant cells for the most part did not take up the carmine stain well, although some of the black particles were taken up.

ii. Carmine solutions and trypanblue were injected into the affected skin of a leprous patient and the bacilli proved to be not colourable with very few exceptions.

L. R.

LLOYD (R. B.), MUIR (E.) & MITRA (G. C.). **The Wassermann Reaction in Leprosy.**—*Indian Jl. Med. Res.* 1923. July. Vol. 11. No. 1. pp. 229–233. [1 ref.]

The Leprosy Research Worker and the Serologist of the Calcutta School of Tropical Medicine have taken advantage of their exceptional opportunities to carry out Wassermann tests in 286 cases of undoubted leprosy, with the following results :—

"1. In a series of 228 adult lepers we find a positive Wassermann Reaction in 41·7 per cent. of all cases, in 27 per cent. of anaesthetic cases, in 47·4 of mixed cases, and in 63 per cent. of nodular cases.

"2. In a series of 58 leper children we find a positive Wassermann Reaction in 62 per cent. of all cases, in 47 per cent. of anaesthetic cases, in 80 per cent. of mixed cases, and in 100 per cent. of nodular cases, *i.e.*, very much higher figures than in adults.

"3. A control of 46 untainted children from the same community as (2) above and whose parents or guardians were lepers showed no evidence of a higher positive Wassermann rate than can probably be accounted for by the average syphilis rate."

The authors hope to report later on the influence of treatment on the reaction.

L. R.

LEWIS (Paul A.) & ARONSON (Joseph D.). **The Complement Fixation Reaction as applied to Leprosy.**—*Jl. Experim. Med.* 1923. Aug. 1. Vol. 38. No. 2. pp. 219–232. [57 refs.]

A survey of the literature reveals contradictory results and no satisfactory generalization on this subject, and the writer's work on tuberculosis suggests that this is due to modifications of the Wassermann reaction being too closely followed, since they found longer periods than the usual one hour at 37°C. necessary for fixation of acid-fast bacilli. In their experiments they tested 45 sera from 39 lepers, together with a number of non-leprous sera, using as antigens various acid-fast bacilli (including those believed to have been cultivated from lepers by their discoverers), bacillary emulsions, alcoholic extracts, Petroff's antigen and cholesterol, and acetone antigens, with two hours' incubation. *B. leprae* of Clegg, Duval and Kedrowsky, *B. tuberculosis* and Petroff's antigen (T. B.) all gave numerous positive results varying between 81·8 and 96·8, Clegg's bacillus being highest with 93·9 per cent.; *S. tuberculosis*, with cholesterol and Acetone-insoluble gave 65·9 and 63·6 per cent. of positive reactions. None of the controls sera gave any positive results with Clegg's organism, which may therefore be of practical value in diagnosis, although these reactions are no evidence of any of these bacilli being the cause of leprosy in view of the most frequent reactions being obtained with the tubercle bacillus. Antibody absorption may be demonstrated in the acid-fast group if the absorbing bacteria are removed by filtration.

L. R.

YAGLE (Elizabeth M.) & KOLMER (John A.). **The Kahn Precipitation in Leprosy.**—*Arch. Dermat. & Syph.* 1923. Aug. Vol. 8. No. 2. pp. 183–185. [3 refs.]

The frequent occurrence of positive Wassermann reactions in cases of leprosy led the authors to test whether the serum of lepers, like that of syphilitics, would give positive precipitation or flocculation reactions with alcoholic extracts. They used the Kahn precipitation method (*vide Arch. Dermat. & Syph.*, Sept. 1922). Of 28 leper serums tested, 23 showed no evidence of syphilis and gave negative reaction; in two with suspicions of syphilis the reaction was doubtful; and in three having clear evidence of syphilis the reaction was positive. The inference is obvious.

L. R.

i. HERXHEIMER (Gotthold). **Die Lepra und ihre Parallelen zur Tuberkulose.**—*Klin. Woch.* 1923. June 4. Vol. 2. No. 23. pp. 1053-1059.

ii. MARCHOUX (E.). **La lèpre du rat et sa transmission probable à l'homme.**—*Paris Méd.* 1923. Oct. 27. Vol 13. No. 43. pp. 313–316. With 2 figs. [4 refs.]

iii. NOËL (P.). **Les nouveaux traitements de la lèpre.**—*Ann. de Dermat. et de Syph.* 1922. Dec. 6th Ser. Vol. 3. No. 12. pp. 644–653.

iv. KÄYSER (J. S.). **Verpleging en behandeling van lepralijders.** [Care and Treatment of Lepers.]—*Tijdschr. v. Vergelijkende Geneesk. enz.* Leiden. 1923. July 16. Vol. 9. No. 1–2. pp. 84–105. [English summary, pp. 103–104.] [19 refs.]

i. A general discussion of well known facts.

ii. This deals with work already reviewed in this *Bulletin*, Vol. 29, pp. 825–826.

iii. This paper gives a brief summary of the advances of recent years in the use of soluble preparations of chaulmoogra, cod liver and other oils, without containing any new observations.

iv. In view of the small numbers of lepers in the Netherlands no special measures are required to prevent an increase of the disease, but they should receive the best treatment in a small sanatorium, which should be founded for the purpose.

L. R.

THE BRITISH EMPIRE LEPROSY RELIEF ASSOCIATION (24, Cavendish Square, London, W. 1.).

This Association has been founded in London with the objects set forth in the attached statement, and it is desired to get into touch with all agencies and workers for the relief of leprosy in the Empire. The Association wishes to ascertain what is being done in each country, and how it can best assist such work, with the object of reducing the disease as rapidly as possible by taking full advantage of recent scientific progress, especially as regards improvement in treatment. Readers are therefore asked to send to the Medical Secretary information on the lines of this questionnaire, and so assist the Association in its work.

QUESTIONNAIRE.

(1) Name of country or area dealt with :
  (*a*) Area in square miles
  (*b*) Population by race or religion and its distribution
  (*c*) Climate and other relevant facts
(2) Census or official rate *per mille*. If not available give your own estimate
(3) What legal powers exist as regards :
  (*a*) Compulsory segregation
  (*b*) Prohibition of occupations concerning food, clothing, and domestic service
  (*c*) Are there legal powers to repatriate leper immigrants and those developing it within a given period after arrival
  (*d*) How far are such powers exercised ?
(4) Give for each leper institution :
  (*a*) The accommodation
  (*b*) Aggregate numbers of each of the last three years
  (*c*) The proportion of voluntary admissions
  (*d*) Can cases be detained until non-infective ?
  (*e*) Are members of the family of lepers examined periodically for incipient leprosy ?
(5) What are the rules regarding :
  (*a*) The separation of the sexes
  (*b*) Marriage of lepers of reproductive ages
  (*c*) Cohabitation of married lepers
  (*d*) Separation of lepers' children at birth
  (*e*) Frequency of leprosy in separated children and their age at time of development
  (*f*) Ditto of children living with leper parents
  (*g*) What is the birth rate of married lepers ?
(6) What is the staff of the institution as regards :
  (*a*) Medical qualified men resident and visiting
  (*b*) Nurses or attendants qualified to give remedies hypodermically If not yet available could any be trained for such work ?
(7) What type of buildings are used, and how far are they and the eqùipment satisfactory ?
(8) What treatments are used, and how long have soluble preparations of chaulmoogra and other oils been injected, and with what results ?

(9) If the improved treatments are not yet in general use would you give them a trial of at least one year if the Association can send supplies and directions for their use ?

(10) Could such treatment be superintended by a competent doctor attending at least once a week and a full report of the trial sent to the Association ?

(11) Are lepers treated at general hospitals, and could separate out-patient leper clinics be established for early cases as has been done successfully in Calcutta ?

(12) In addition to improving treatment, in what ways could the Association best help you ?

(13) Have you any suggestions to make regarding the proposed lines of work of the Association ?

(14) Please supply any additional information of interest regarding the prevalence and modes of spread of leprosy

(15) Do the indigenous population employ any special remedy against leprosy, and if so, can you obtain some for investigation ?

(16) Do you see the Tropical Diseases Bulletin, or would you like to have abstracts of leprosy papers ?

(17) Mention any local customs or conditions affecting leprosy work

(18) How is your area off for hospitals, qualified doctors, and public health activities ?

(19) Please state how you consider the extinction of leprosy could be effected

(20) What is the prospect in your area of Government and public support for an anti-leprosy campaign ?

(21) Please give other relevant facts, if any, not covered by this questionnaire

The following extracts are taken from the Memorandum of Sir Leonard ROGERS, Medical Secretary, regarding the Medical Policy of the Association.

The objects are—

1. To extend the application of the improved methods of treatment as rapidly as possible throughout the Empire by (*a*) supplying the latest information and the most approved drugs to leper institutions, settlements and hospital clinics ; (*b*) training those in charge of lepers in applying the treatment efficiently.

2. To support sound schemes of segregation, with the best treatment, in countries where the great majority of the lepers can thus be dealt with and the disease rapidly reduced, as in the West Indies, etc.

3. To collect information and statistics and to issue bulletins of information to workers among lepers.

4. To support further researches on both the etiology and treatment of leprosy with a view to discovering more efficient methods of prevention and to further simplify, shorten, and cheapen the curative measures.

CORRIGENDUM.

Dr. R. R. SCOTT, Medical Officer of Health, Dar-es-Salaam, points out that under heading Tanganyika Territory in Vol. 20, No. 6, p. 483, the annual report of the Sanitation Branch of the Medical Department should have been attributed not to him but to Lt.-Col. D. S. SKELTON, Senior Sanitation Officer. The authorship of the section in question, the leprosy portion of which was summarized, is not stated in the Report.

BABONNEIX (L.) & RIVALIER (E.). **Un cas de lèpre avec syphilis acquise et ectasie de la carotide droite.**—*Bull. et Mém. Soc. Méd. Hôpit. de Paris.* 1923. June 28. Year 39. 3rd Ser. No. 22. pp. 1004–1008.

BERNUCCI (F.). **Nota sulla alterazioni della innervazione cutanea nelle varie forme di lebbra. (Comunicazione preventiva.)**—*Giorn. Ital. d. Malat. Vener, e d. Pelle.* 1923. May. Year 58. Vol. 64. No. 2. pp. 547–549. [See this *Bulletin,* Vol. 20, p. 824.]

BIEHLER (Ryszard). **Próby szczepienia tradu na kozach. Lepra Impfversuche bei. Ziegen.**—*Przegl. Epidemjol.* Warsaw. 1922. Vol. 2. No. 2. pp. 235–237. With 1 text fig. [German summary p. 238.]

DELAMARE (G.). **Lèpre tubéreuse avec hyperostoses tibiales ; lèpre pachydermique avec glossite scléreuse.**—*Presse Méd.* 1923. June 20. Vol. 31. No. 49. pp. 549–551. With 6 text figs. [6 refs.]

HIRSCHBERG (M.). **Dystrophie adiposogénitale (Syndrome hypophysaire adiposogénital) chez un lépreux.**—*Bull. Soc. Path. Exot.* 1923. Feb. 14. Vol. 16. No. 2. pp. 75–77. With 1 text fig.

HUDELLET (G.). **Lèpre et Aïnhum.**—*Bull. Soc. Path. Exot.* 1922. July 12. Vol. 15. No. 7. pp. 648–651. With 2 text figs.

METALNIKOV (S.) & TOUMANOFF (K.). **La lèpre chez les Insectes.**—*C. R. Soc. Biol.* 1923. Nov. 10. Vol. 89. No. 31. pp. 935–936.

HELMINTHIASIS.

KENYA. Colony and Protectorate of. **Annual Medical Report for the Year ending 31st December, 1921.** [GILKS (John L.). Principal Medical Officer.] London: Waterlow & Sons, Limited, London Wall. pp. 92; 149-151.

The outstanding point of interest in the helminth infections noted is the discovery of a case of *Sparganum mansoni.* The patient was under treatment at the Native Hospital, Nairobi, and, as in the case of the parasite previously recorded by SAMBON on material collected by Dr. BAXTER, the worm was found in an abscess in the thigh of a Masai.

In 315 stools examined in the laboratory at Nairobi during 1921, the following infections were found: -

Ankylostome ova. 33 cases	10·5 per cent.
Taenia saginata ova. 30 cases	9·5 per cent.
Trichuris trichiura. 26 cases	8·3 per cent.
Ascaris lumbricoides. 12 cases	3·8 per cent.
Strongyloides stercoralis. 10 cases	3·2 per cent.
Schistosoma mansoni. 9 cases	2·9 per cent.

Although as compared with the figures of the previous three years the actual number of cases of *Schistosoma mansoni* had decreased, the percentage had risen from 1·8 per cent. in 1919 and 2·4 per cent. in 1920 to 2·9 per cent. in 1921. Rectal bilharziosis is much more common in Kenya than the urinary type.*

R. T. Leiper.

McCONNELL (R. E.). **A Report on Helminthiasis in the West Nile District.**— *Uganda Protectorate Ann. Med. & San. Rep. for the Year ended 31st December, 1922.* pp. 61–66.

The primary purpose of the report is to draw attention to the presence of ankylostomiasis and bilharziasis in the West Nile District of the Uganda Protectorate. Of 100 natives 99 harboured *Necator americanus. Strongyloides intestinalis* is also reported for this province apparently for the first time. In four cases small nematodes were found (1) 2·63 cm. long by 55 mm. wide, white with fine transverse cuticular striations and a pair of anterior and posterior cuticular alae. (2) 6·2 cm. long, white, with lateral cuticular ridges and a three lipped mouth. (3) Three worms, one being 4 cm. long, with numerous papillae on the tail, possibly a young *Ascaris lumbricoides* and the other two 3 cm. by 0·64 mm. and 2·8 cm. by 0·53 mm. white. (4) Two worms of different species, one with cephalic papillae and corona radiata and the vagina near the anus, the other 1·1 cm. long, cylindroid with a trilobed ribbed bursa and a mouth of ankylostomoid type. The bilharziasis cases were chiefly of *S. mansoni* type, the ova being found in 7 out of 100 unsuspected cases. Four other cases were detected among 22 patients who complained of abdominal troubles and of whom 21 harboured hookworms.

R. T. L.

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* [Dr. G. V. ALLEN, who was in part responsible for the work recorded in this report, says, in a personal communication, that the urinary type has since been found to be common among the Coast natives. Ed.]

HODSON (Vincent S.). **Intestinal Parasites in the Sudan.**—*Jl. Trop. Med. & Hyg.* 1923. July 16. Vol. 26. No. 14. pp. 244–245. [1 ref.]

In order to obtain a record of the prevalence of intestinal parasites in the Sudan the author has for some years had routine examinations carried out on the faeces of patients at the Khartoum Civil Hospital, and of boys at the Gordon College and the Omdurman School. The percentage infected was found to be in the neighbourhood of 40 for the year 1922. At the hospital ankylostomes were most frequently met with (in 48 per cent.), but amongst the boys at both schools *Taenia nana.*

Among the examples of multiple infection is mentioned a patient with malaria, relapsing fever, hookworm, *Taenia saginata*, *S. haematobium* and *S. mansoni*. This man had, incidentally, been admitted for a crushed foot.

H. Harold Scott.

FAUST (Ernest Carroll). **Practical Parasitology in South China.**—*Jl. Trop. Med. & Hyg.* 1923. Sept. 1. Vol. 26. No 17. pp. 273–275.

Noso-geographically China is divisible into two areas, one, lying to the north of the Hwai River basin, constituting a dry northern region of slight infection, and one embracing the warm moist areas of Central and South China and constituting a region of heavy infectivity. In the latter area cestode infections are of only minor importance as contrasted with Clonorchiasis, Schistosomiasis, Ankylostomiasis, Ascariasis, Trichuriasis and Filariasis. Clonorchiasis is a very heavy infection among the population in the Pearl River Delta. Fasciolopsis is of clinical importance in the Kwangtung Province, as is also the oriental blood fluke. The intermediate host of *S. japonicum* has been found in the region of Fatshan in the Canton area. The author emphasizes the necessity of studying the customs of the people and the soil conditions in order to establish effective barriers against infection.

R. T. L.

WOLFF (J. W.). **Statistische gegevens omtrent eenige worminfecties der bevolking te Paramaribo.** [Helminth Infections at Paramaribo.] —*Geneesk. Tijdschr. v. Nederl.-Indië.* 1923. Vol. 63. No. 3. pp.373–391. English Summary p. 390. With 6 figs. [15 refs.]

The author describes the arrangements at Paramaribo [Dutch Guiana] for the dispensary treatment of hookworm patients. Examination showed that ankylostome infection among British-Indians was very high, 96 per cent. This is ascribed to the fact that they have their own plots of ground which they cultivate and constantly subject to infection. Treatment of patients was of very little use unless combined with hygienic measures applied to their dwellings, yards, and outhouses.

Ascaris infection, on the other hand, is comparatively low (35 per cent.) as compared with 76 per cent. amongst the negroes and 58 per cent amongst the Creole population. It is suggested that the onions, garlic and other herbs which enter largely into the diet of the British-Indians act as vermifuges.

1,500 persons were examined for evidence of schistosomiasis. 7·4· per cent. of the British-Indians, 3·9 per cent. of the Creoles, and 1·6 per cent. of the negroes were found to be infected with *S. mansoni.*

H. H. S.

de Almeida (Junior) (A.). **As Verminoses nas escolas.** [Helminthiasis in Schools.]—*Ann. Paulist. Med. e Cirurg.* 1923. Sept. Year 11. Vol. 14. No. 9. pp. 87–92. With 1 fig.

Examination of the faeces of school-children of S. Paulo shows that in urban districts Ascaris and Trichuris predominate, Oxyuris being also found in considerable numbers. In rural districts Ankylostomes are present in addition.

Of 883 children below 12 years of age in Capital do Amazonas 635 (71·9 per cent.) harboured worms of some kind—Necator 95·2, Trichuris 82·3, Ascaris 52·2, Oxyuris 30·2, Eustrongyloides 23·9 per cent. In Barra Funda of 1,177 school-children 91·6 per cent. were positive—Trichuris 71, Ascaris 47·9, Ankylostomes 11·8, Hymenolepis 10·1, *Taenia saginata* 1·9, Oxyuris 1·7, Eustrongyloides 0·84 per cent.

[Presumably *Eustrongyloides* is used in this paper for the genus *Strongyloides*.]

In a third group 687 were examined, and of these 459 (66·81 per cent.) were positive and the following were the proportions in which ova were found: Ascaris 39·44, Trichuris 34·7, Hymenolepis 7·86, Ankylostomes 1·89, Oxyuris 0·72 per cent.

The number of boys infected was slightly greater than that of the girls in the last group—67·91 as against 65·99. The length of stay a the school did not affect the percentages to any marked extent; thus the figures given for the first four years are respectively 71·17, 67·90, 62·79 and 71·60 per cent.

Combining the returns from the various schools of the Capital the general rate of infection appears to be about 60 per cent.

H. H. S.

Harle (A.), Sutterlin (Th.) & Zeiss (H.). **Helminthologische Untersuchungen an Moskauer Kindern.**—*Ztschr. f. Hyg. u. Infektionskr.* 1923. July 6. Vol. 100. No. 2. pp. 140–154. [19 refs.]

The authors examined the faeces of 878 children in Moscow and found 437 (49·8 per cent.) infected with worms of one kind or another. The advantage of Fülleborn's enrichment method with concentrated salt solution over direct examination is shown, the former giving 15 to 25 per cent. more positive results. Ascaris proved to be the predominant infection at all ages.

Investigations were carried out as regards the blood changes set up. Strange to say the haemoglobin percentages were not found to differ in the worm-infected children from those in the non-infected. The eosinophile percentage is, in the authors' opinion, of no diagnostic value. Counts ranging between 7 and 33 per cent. were met with in children in whom there were no indications of the presence of worms, and it is suggested that these high figures are ascribable to defective nutrition, toxins, or the after-effects of infectious fevers.

H. H. S.

BRÜNING (Hermann). **Wurmkuren bei Kindern, ihre Gefahren und Verhütung. (Mitbesonderer Berücksichtigung des amerikanischen Wurmsamenöles).**—[The Dangers of Worm Cures in Children with Special Reference to Chenopodium.]—*Deut. Med. Woch.* 1923. Dec. 7. Vol. 49. No. 49. pp. 1492–1494. [4 refs.]

The author relates some unfortunate experiences with oil of chenopodium. Of five cases recorded four of the patients died, while the fifth suffered from disturbances of hearing for more than six months afterwards. It is hardly fair, however, to speak of this as a mortality of 80 per cent. The doses appear to have been unduly large, for a child of 5 years was given three doses of 20 drops, and in some of the cases castor oil was administered as an aperient, and in another cod-liver oil was prescribed in addition. In one case a single ascaris was expelled; none of the others passed any worms at all, nor were any found at the autopsies.

To avoid the dangers it is recommended that the diagnosis of the presence of worms should be definitely made and the drug not given merely on suspicion; that, unless the patient is otherwise in good health, oil of chenopodium is better avoided; that it should not be accompanied or followed by castor-oil, cod-liver oil, or any such, and finally, that the dosage should be carefully graded according to the age of the child. [The question of the employment of a preparation standardized as to its Ascaridol content is not mentioned.]

H. H. S.

MARCHAND (L.) **Convulsions vermineuses et épilepsie.**—*Gaz. des Hôpit.* 1923. Aug. 2 & 4. Vol. 96. No. 62. pp. 993–995. [37 refs.]

A brief but interesting paper discussing the relation between convulsions due to helminth infection and epilepsy. After pointing out the fallacies, on the one hand, of ascribing epileptiform attacks to worms merely because ova are seen in the faeces, and, on the other, of ruling out helminths as a cause because the symptoms continue after expulsion of the worms, he shows how, in a child with an unstable nervous system, irritation of the intestinal mucosa by movements of ascarides and taeniae, or absorption of toxins produced by them, or, in the case of oxyurides, pruritus, may cause convulsions, but that these will disappear with removal of the worms. Apart from this, however, he thinks that helminth toxins on reaching the brain may set up definite meningeal reactions with lymphocytosis, adhesions, and foci of cortical sclerosis, which may cause true epilepsy subsequently.

H. H. S.

FÜLLEBORN (F.). **Ueber Tetrachlorkohlenstoff als Antihelminthikum.** [Carbon Tetrachloride as Anthelmintic].—*Arch. f. Schiffs- u. Trop.-Hyg.* 1923. Aug. Vol. 27. No. 8. pp. 280–286. [4 refs.]

This paper, though bringing forward no new points, gives a good account of the use of carbon tetrachloride in helminthic infections. Special attention is drawn to the following facts:—It is the best drug known against hookworm; it is harmless even for children and pregnant women, unless impurities are present; no preliminary treatment, dietetic or otherwise, is necessary; since in most cases only a single dose is needed it is a good drug to use for mass-treatment; it is cheap. Though not very effectual against ascaris when used alone it may be made so by the addition of oil of chenopodium, 1 part to 11 of carbon tetrachloride, the dose being 0·2 cc. for each year of age. It is powerless against Strongyloides and only active for Taenia when combined with thymol.

H. H. S.

DOCHERTY (J. F.) & NICHOLLS (Lucius). **Report of Three Autopsies following Carbon Tetrachloride Treatment.**—*Brit. Med. Jl.* 1923. Oct. 27. p. 753. [1 ref.]

From a study of the tissues of three condemned prisoners who had received 4 cc. of carbon tetrachloride the authors conclude that the drug may produce fatty degeneration of the liver, but that these changes are of a temporary character and do not appear to contra-indicate the use of the drug, for many patients have been treated with much larger doses and have not complained of symptoms other than very slight giddiness; of many hundreds of school children who have received this treatment none have had any sign of ill-health. In some of the cases the changes in the liver were so marked that signs of marked ill-health during life should have been expected, but these were absent; consequently it is inferred that much fat, presumably from fatty degeneration, may appear in the liver and yet be of small importance clinically.

R. T. L.

MOLLOY (Daniel M.). **Notes on the Pharmacology and Therapeutics of Oil of Chenopodium and Investigations on the Anthelmintic Value of its Components.**—*Jl. Pharm. & Experim. Therap.* 1923. July. Vol. 21. No. 6. pp. 391-400. 10 refs.

HALL and HAMILTON having stated that the chief anthelminthic principles resided in the lighter (or terpene) fraction distilled from oil of chenopodium while the heavier (ascaridole-containing) fraction was not only less potent but contained also the toxic and irritant constituents, the author carried out tests on prisoners at the Nicaraguan Penitentiary and shows that this paradoxical state of things was not confirmed. He found that the terpene fraction, which constitutes about 40 per cent. of the whole oil, has no anthelminthic action but that the efficiency rests entirely on the ascaridole fraction, representing 57 per cent. of the oil, 98 per cent. of worms being expelled by its use. This part, however, contains also the toxic principles of the drug, and these cannot be separated. In view of the variability of oil of chenopodium in anthelminthic properties the author suggests that the drug should be standardized to obtain ascaridole of constant boiling point, which could easily be done by fractional distillation. The paper is a valuable contribution to the question of hookworm therapy.

H. H. S.

BRUMPT (E.). **Utilisation de l'antiformine pour l'épuration des selles destinées à la culture de certains œufs d'helminthes.**—*Ann. Parasit. Humaine et Comparée.* Paris. 1923. Aug. Vol. 1. No. 3. p. 301.

Antiformin has been utilized by YAOITA and by MACNEIL, in association with ether, for the concentration of eggs of helminths from the faeces. The author has found a technique which he has successfully applied to the faeces of a fox which contained ascarids and trichosomes.

The stool, placed in a conical vessel, is shaken in a mixer with a smaller volume of antiformin for some minutes. The mixture is then diluted in 20 to 30 times its volume of water and passed through a fine sieve. The sediment collected by decanting or centrifuging is placed in flat bottomed vials containing 1 per cent. formol. After 4 days in an incubator at 30° the ascarid eggs were found to contain mobile embryos and the trichosome eggs contained morulae.

R. T. L.

MORENAS (L.). [**L'Anaphylaxie dans les Helminthiases intestinales.**]—*Jl. Méd. de Lyon.* 1922. Dec. 20. No. 71. pp. 773-780. [Summarized in *Arch. f, Schiffs- u. Trop.-Hyg.* 1923. Aug. Vol. 27. No. 8. p. 295.]

This paper summarizes the anaphylactic symptoms resulting from experimental injection of extracts of ascaris and of hydatid fluid. The author is of opinion that several of the clinical signs occurring in helminth infection are anaphylactic in nature.

H. H. S.

STUNKARD (Horace W.). **Studies on North American Blood Flukes.**—*Bull. of the Amer. Museum of Natural History,* New York. 1923. Oct. 8. Vol. 48. Art. 7. pp. 165-221. With 13 plates.

The blood-infesting trematodes comprise the three families, *Schistosomidae, Spirorchidae* and *Aporocotylidae.* Of these the first is unisexual, the others hermaphrodite. This monograph, which gives a valuable résumé of these families and discusses the relationships and origin of the various groups, is of medical interest in so far as it revises somewhat the views regarding the origin of the schistosome worms of man and mammals put forward by ODHNER (1912) [see this *Bulletin,* Vol. 21, p. 180]. Certain morphological characters are common throughout the group, but within the families and genera there are great morphological disparities. Those parasitic in fish are without organs of adhesion; among the parasites in the turtle one group has only an oral sucker, the other has both oral and ventral suckers. In the family *Schistosomidae* there are genera with no suckers and others with two. Other diversities are quoted, and probably no other trematode group manifests such unusual and unexplainable differences. The author, however, feels justified in regarding these as closely related and considers their evolution to have proceeded from the type of *Sanguinicola* and *Aporocotyle* through *Spirorchis* and *Hapalotrema* to the Schistosomes.

R. T. L.

MAPLESTONE (P. A.). **A Revision of the** *Amphistomata* **of Mammals.**—*Ann. Trop. Med. & Parasit.* 1923. July 12. Vol. 17. No. 2. pp. 113-212. With 4 plates & 32 text figs. [28 refs.] [Human Parasites pp. 164-5; 193-5.]

The Amphistomes are represented in man by only two species, *Gastrodiscoides hominis* and *Watsonius watsoni,* but they are a large widespread and important group of flukes, many species of which are of importance to the veterinarian in the tropics. In this critical review of the whole group the author has removed much of the confusion due to an unnecessary multiplicity of genera and has now made the identification of species found a relatively straightforward matter. The author's own studies on hundreds of specimens has contributed much to the elucidation of many obscure problems in specific relationships. In his dealing with the species which infect man the author accepts Gastrodiscoides as a valid genus, although the generic definition must be emended for the presence of a genital papilla or a genital atrium is a matter of chance [? or preservation] and cannot in his opinion be accepted as of diagnostic value. Of greater interest are his conclusions on the systematic position of *Watsonius watsoni.* He is led by a comparison of STILES and GOLDBERGER's description of *Pseudodiscus hawkesi* with this species to conclude that the two worms are practically identical, except in size which may be attributable to age, and he expresses the view that they are actually identical, but in the absence of material, and as one has man as a host and the other the elephant, he does not feel justified in merging them, but he places them in the same genus, *Watsonius* becoming a synonym of *Pseudodiscus* on grounds of priority.

R. T. L.

BARLOW (Claude H.). **Life Cycle of *Fasciolopsis buski* (Human) in China.**—*China Med. Jl.* 1923. June. Vol. 37. No. 6. pp. 453–472. With 1 plate and 7 figs. [2 refs.]

The paper gives a useful résumé of present day knowledge of *Fasciolopsis buski* and of recent work on its life cycle and mode of spread. Cases in Shaohsing, the reputed centre of this infection in China, came chiefly from the north of the city and almost none from the south. The villages Entsong and Siaosan appear to be the most intensely infested. The life cycle has been worked out by NAKAGAWA (1920) in North Formosa, but important facts have been discovered by the author, such as the actual source of human infection. He finds that the Chinese acquire this from eating the water-caltrop (*Trapa natans*). The red water-caltrop is particularly implicated. As many as 40 encysted cercariae have been found on one nut of this species and an average of 17·9 cysts were noted on nuts gathered from the same field. Every nut examined showed some infection. Careful notes are given of the results of self infection experimentally undertaken by the author. Charts give the growth record and measurements of 3,721 flukes passed by a naturally infected patient. Compared with the results obtained by NAKAGAWA in the pig it would appear that Fasciolopsis grows larger and matures more rapidly in man. The largest worms found were 3½ in.–4 in. long, but it would appear that the size is simply determined by the length of time the worm can remain in a locality favourable to its growth, and the author sees no reason to depart from his adhesion to the view that one species occurs in man. On the other hand, he has never seen a case of infestation in the pig in these heavily infected areas, and in Yungchun Fukien, where the pigs are heavily infected, he did not find a single human case.

The subject calls for further investigation.

R. T. L.

KOO (U. K.). **Paragonimiasis with Report of a Case.**—*Nat. Med. Jl. China.* 1922. Dec. Vol. 8. No. 4. pp. 259–263. With 1 text fig. [4 refs.]

A typical case of Paragonimus infection, which was not diagnosed for some time because only stained smears were examined and not the fresh sputum nor, apparently, the faeces. This is the first case observed in St. Luke's Hospital, Shanghai. The infection was probably contracted in Korea.

H. H. S.

CAWSTON (F. G.). **Possible Presence of Paragonimiasis amongst Indians in Natal.**—*Jl. Trop. Med. & Hyg.* 1923. Aug. 15. Vol. 26. No. 16. pp. 263–264.

There is not the slightest evidence, even granting the occurrence of styletted cercariae in the local molluscs, that the Paragonimus occurs either in Indians or in Africans in Natal. The paper deals with preventive measures to meet a purely hypothetical situation.

R. T. L.

GEHRINGER (George M.). *Clonorchis sinensis* **in Panama.**—*Proc. Med. Assoc. Isthmian Canal Zone.* 1920. Jan.-Dec. Vol. 13. Pts. 1 & 2. pp. 103-106.

The pathological conditions in the liver in three Chinese patients with Clonorchis infection are described, and the author expresses the fear that, since "*Limnaeus minutus*" clings to vegetables and water cress, infection may spread in Panama. The changes in the liver were such as are usually associated with this condition, but, in view of the work of MUTO, KOBAYASHI and others on the life-history of *Clonorchis sinensis*, the fears of spread without the intervention of the second (fish) host would appear to be groundless. None but Chinese were found infected, and they were probably all introduced cases.

H. H. S.

SHATTUCK (George Cheever). **Clonorchiasis in Boston.**—*Boston Med. & Surg. Jl.* 1923. Aug. 2. Vol. 189. No. 5. pp. 165–166. [2 refs.]

So far as the author has been able to ascertain no case of clonorchiasis has yet been reported from the New England States and the 54 cases, which he mentions as seen in Boston during the past 16 months occurred in Japanese and were obviously exotic infections. Only two cases are briefly described and contained little of interest.

R. T. L.

KUWABARA (Shosaburo) & MUTŌ (Masatomo). [**Is Immunization possible in Liver Distomiasis?**]—*Chuo. Ig. Kw. Z. Nagoya.* 1921. pp. 34-45. [Summarized in *Japan. Jl. Med. Sci.* Tokyo. 1922. Vol. 1. No. 2. p. 145.]

A positive reaction was obtained in the complement fixation tests made upon human cases of liver distomiasis of long standing, but the test was negative in a case of recent infection. In a dog kept for two years and eleven months after artificial infection with liver flukes [*Clonorchis* presumably] a positive immunological reaction was obtained. The immunological reaction was found to have no connexion with jaundice, ankylostomiasis, ascariasis and oxyuriasis, but was specific to liver distomiasis. The author concludes that immunization is possible in liver distomiasis.

R. T. L.

REYNAUD (G.). & LÉGER (M.). **Les bilharzioses ou schistosomoses dans les colonies françaises. Géographie médicale.—Epidémiologie. —Traitement.**—*Congrès de la Santé Publique et de la Prévoyance Sociale, Marseille, 11 17 Septembre, 1922 Rapports.* pp. 25–46. [67 refs.]

This report summarizes our knowledge of the geographical distribution of bilharziasis in the French Colonies, the recent work upon the life history of *S. haematobium* and *S. mansoni* and the treatment of these infestations by tartar emetic, etc. There is an extensive bibliography. The only new observations reported concern the incidence of *S. mansoni*, which according to M. Léger occurs in from 8 to 10 per cent. of the population of Guadeloupe and Martinique, whereas in Guiana [presumably French Guiana] it is only 2 per cent.

R. T. L.

CHRISTOPHERSON (J. B.). **Intermediary Hosts of** *Schistosoma haematobium* **and** *mansoni* **in Nyasaland.** [Correspondence.]—*Brit. Med. Jl.* 1923. Sept. 8. p. 437.

The freshwater molluscs found in the Karonga district of Nyasaland belong to 5 species :—*Lanestes affinis, Vivipara robertsoni, Limnaea natalensis, Physopsis* sc. *globosa,* and *Planorbis* sp. near *sudanicus.* Certain preliminary experiments made by Capt. W. H. DYE appear to lead Christopherson to infer that of these molluscs the carrier of *S. haematobium* is probably *P. globosa* and of *S. mansoni* the *Planorbis* sp., for these alone show attraction to the miracidia.

R. T. L.

CLAPIER (P.). *Schistosomum haematobium* **à Libreville (Gabon).**—*Bull. Soc. Path. Exot.* 1923. July 11. Vol. 16. No. 7. pp. 559–564. [2 refs.]

Schistosomiasis is not common in Libreville, and most of those infected have brought the disease with them. Thus, amongst 154 soldiers 7 were found all of whom had probably been infected in childhood before coming to the district. Two others, however, exhibiting rectal infection with *S. haematobium*—there were no urinary symptoms were indigenous. The source whence these were infected is not known, as the search for mollusc hosts in these parts has not yet been undertaken. The author speaks highly of the efficacy of emetine intravenously.

H. H. S.

CHARRIER (H.). **Au sujet de la Bilharziose au Portugal et au Maroc.**—*Bull. Soc. Path. Exot.* 1923. July 11. Vol. 16. No. 7. pp. 491–494. [6 refs.]

Schistosomiasis made its appearance in Portugal in 1918, and was thought to have been brought thither by fishermen from Tangier. Fishing operations had been started there in 1914, but abandoned, owing to the outbreak of war, and restarted in 1918. Enquiries, however, revealed the fact that the disease is not known at Tangier either amongst Europeans or the indigenous population. *Bullinus contortus,* the intermediate host of schistosomiasis in Marrakech or its neighbourhood, and *Planorbis dufourii* (the vector in Portugal) are found in the northern part of Morocco, but examination of large numbers failed to yield any cercariae. The source whence Portugal became infected is, therefore, still undecided.

H. H. S.

ANDERSON (Charles W.). **Enquête et recherches sur la bilharziose en Tunisie.**—*Arch. Instituts Pasteur de l'Afrique du Nord.* 1923. Feb. Vol. 3. No. 1. pp. 3–21. With 3 plates, 6 figs. & 2 maps. [15 refs.]

The author has made a survey in Tunis of the incidence of bilharziasis and its reputed carriers. The genus *Planorbis* is represented by the species *Planorbis philippii* var. *subangulatus,* and this is limited to the Northern region between 37°21 N. and 36°23 N. The most important focus is Oued Bezirck. *S. mansoni,* however, does not occur in the whole Regency, and the distribution of this species of Planorbis cannot be correlated with schistosome infection. The genus *Bullinus* is widely distributed, and the occurrence of specimens of this genus coincides with cases of *S. haematobium*. Three species were encountered, *viz.*, *Bullinus contortus*, *B. brochii*, and *B. dybowski*. *B. contortus* was noted especially at Tabarca, Oued-Bezirck, Kairouan, Nefzaoua (Tombar, Rhamat, Djemana, Bazma, El-Goléa). *B. brochii* has an endemic focus at Gafsa and *B. dybowski* at Degache. A useful map indicates the localities visited. The paper gives some observations on the egg laying and bionomics of Bullinus and concludes with notes on attempts to infect various fresh-water snails, none of which showed any specific attraction for the miracidia of *S. haematobium*.

R. T. L.

CAWSTON (F. G.). **Schistosoma Infestation.** [Correspondence.]—*Brit. Med. Jl.* 1923. Sept. 8. p. 437.

The author has noticed slight manifestations of *Schistosoma mansoni* in two patients in Natal who have never left the country, and in both cases complicating infection with *S. haematobium*. The finding of *Segmentina kanisaensis*, Preston, at Merebank, Natal, is considered [without much justification] to support the assumption that *S. mansoni* has been introduced from Egypt, for the shell [which apparently has not been proved anywhere a carrier] was previously only known from the Upper Nile. In the author's own case of accidental infection with bilharziasis the eosinophilia rose to 39·9 per cent. during the hepatic invasion with the fluke and fell to 12 per cent. in the succeeding few months without treatment.

Commenting on a recent paper by SINDERSON and MILLS on rectal papillomata (see this *Bulletin*, Vol. 20, p. 941) in a case in the Baghdad Hospital the writer regrets that intravenous antimony was not employed before the surgical measures were undertaken, for extensive bilharzia tissue rapidly subsides after the adults and their eggs have been destroyed by this injection.

R. T. L.

CARDOSO (Elyson). **Contribuiçâo ao estudo da schistosomose no Estado de Sergipe.**—*Brazil-Medico.* 1923. Oct. 30. Year 37. Vol. 2. No. 16. pp. 239–240.

The author investigated various districts of the State of Sergipe with a view to ascertaining the prevalence of schistosomiasis among the population by faecal examination and that of Planorbis by examining collections of water for snails. In Estamia and Santa Lazia a few cases were seen but no mollusca obtained ; in Aracajú 449 cases were met with, and in all but three other parasites were present also, notably hookworms. 263 of the patients were females, 186 males. The higher incidence among the former is attributed to their standing in the water-pools washing clothes. *Planorbis centrimetralis* was the common intermediate host. Where the water supply would not be too reduced thereby the author recommends filling in some of the ponds ; otherwise the preventive measures brought forward are on the usual lines—boiling the water for drinking, preventing the passage of excreta into the streams, treating cases with antimony, and so forth.

H. H. S.

IBRAHIM, ALY BEY. **Bilharziasis of the Ureter.**—*Lancet.* 1923. Dec. 1. pp. 1184–1186. With 3 figs. [12 refs.]

Bilharziasis of the ureters is a far less widely recognized affection than bilharziasis of the bladder and is much more dangerous and intractable. Typical cases of renal colic have frequently puzzled surgeons practising in Egypt, for the presence of stone was not revealed by the most careful radiographs. Probably nine out of ten of these are attributable to ureteral bilharziasis. The same lesions explain most cases of hydronephronsis.

Now that bilharziasis can be successfully treated with tartar emetic, the outlook is hopeful provided cases are recognized early. The disease passes through three fairly definite pathological phases, each of which gives a different clinical picture.—STAGE I. *Infiltration with ova,* manifested by (a) sandy patches, (b) sessile infiltrations, (c) papillomata. The mucosa is still intact and the muscular wall in good condition. The kidney appears normal. STAGE II. *Ulceration and fibrosis.* This follows necrosis of the mucosa. The muscular wall atrophies. There is a narrowing and subsequent dilatation of the ureter above this point. The kidney suffers from pressure atrophy. STAGE III. *Cicatrization, stricture and obliteration.* The lumen becomes obliterated and replaced by a solid fibrous cord. The upper part of the ureter and the pelvis of the kidney become dilated. Eventually the kidney becomes a fibrous sac containing urine or pus. The clinical signs and symptoms accompanying these stages are illustrated by a series of clinical notes of eleven cases.

R. T. L.

PFISTER (E.). **Die Ovispermia Bilharzica (Eiersamen bei Bilharziakrankheit.**—*Zeitsch f. Urol.* Leipzig. 1922. Vol. 16. No. 11. pp. 488–489. [4 refs.]

The frequency and prevalence of oöspermia (the presence of schistosoma eggs in the spermatic fluid) is not an easy matter to determine, but that it does occur and may be an early symptom, even preceding the haematuria, was shown by MADDEN in 1911. The author states that the ova may come from any part of the genital system, the prostate, spermatic cord, testis, epididymis, urethral glands and seminal vesicles, and not from the last named only as has been hitherto believed.

H. H. S.

PFISTER (E.). **Die orchitis bilharzica.**—*Ztschr. f. Urol.* 1922. Vol. 16. No. 1. pp. 16–18. With 1 text fig.

Apropos of a patient under the author's care who presented an orchitis with a fistula discharging schistosoma eggs, the question of the mode of origin of this condition is considered. The orchitis may occur without any affection of the tunica vaginalis, and it is suggested that bilharzial orchitis and epididymitis may arise either directly by penetration or embolism of ova in the parenchyma of the organ, subsequent inflammation giving a picture resembling a tuberculous condition with or without fistula, or indirectly by passage along the vasa deferentia.

H. H. S.

BRUSSET & BUROLLET (P. A.). **Quelques réflexions au sujet d'un cas de bilharziose.**—*Arch. Méd. et Pharm. Milit.* 1923. Mar. Vol. 78. No. 3. pp. 287–289.

A brief account is given of a patient suffering from haematuria and pyuria, whose disease had been diagnosed, after cystoscopic examination, as tuberculous cystitis, although the bacilli were not found in the urine nor were any physical signs of tuberculosis detected elsewhere. The urine contained ova of *Sch. haematobium* in large numbers. [One is left in doubt whether tuberculous disease was actually present in addition to the schistosomiasis.]

H. H. S.

ARANTES (Antonio). **Sobre dois casos de Schistosomose autochtones em Santos. (Nota previa.)** [Two cases of Schistosomiasis originating in Santos.]—*Ann. Paulist. Med. e Cirurg.* 1923. Sept. Year 11. Vol. 14. No. 9. pp. 95–96.

Two cases of schistosomiasis are recorded as having originated in Santos. Both were children, aged 7 and 8 years respectively, and the ova of *S. mansoni* were found in the stools. Neither patient exhibited any of the usual symptoms of schistosome infection. Search for the intermediate host was at first unsuccessful, but subsequently a Planorbis was discovered, probably *P. centrimetralis.* The first patient was treated with emetine and the ova disappeared. Nothing further is stated as regards the second case.

H. H. S.

JONES (S. B.). **Intestinal Bilharziasis in the West Indies : Intermediate Host.**—*Jl. Trop. Med. & Hyg.* 1923. Aug. 1. Vol. 26. No. 15. pp. 253-254.

Intestinal bilharziasis occurs in the white and black inhabitants of the West Indies, and is present in Guadeloupe, French St. Martin, St. Kitts, probably Antigua, and in Santo Domingo and Porto Rico. The mollusc which prevails and is apparently the intermediate host in French St. Martin is *Planorbis antiguensis*, Reeve. This is probably also the carrier in St. Kitts and in Antigua. In the latter island myriads of Planorbis were found at Body Pond's Dam, the reservoir of the city of St. John's. [The author paints a somewhat lurid picture of the tragic possibilities of the spread of the infection which he regards with unnecessary pessimism.]

R. T. L.

MELENEY (Henry Edmund) & FAUST (Ernest Carroll). **The Intermediate Host of** *Schistosoma japonicum* **; I. Its Discovery in the Soochow Region. II. Its Distribution in China.**—*China Med. Jl.* 1923. July. Vol. 37. No. 7. pp. 541–554. With 7 figs. [9 refs.]

I. In the region North of Soochow, known to be an endemic focus of schistosomiasis, the authors collected hundreds of snails of the species *Oncomelania* (=*Hemibia*) *hupensis*, Gredler, and found 5 per cent. naturally infected with *S. japonicum* cercariae. This species closely resembles the Japanese carrier. Mice were successfully infected experimentally. The only other snail in the region with which *O. hupensis* can be easily confused is *Melania cancellata*, the youngest forms of which are about the size of the largest schistosoma carrier.

The Melanias, however, live only beneath the surface of the water, and the shell is much harder, with the vertical ridges more prominent and further apart.

II. The intermediate host lives close to the edge of clear, relatively still, fresh water. It is most plentiful on the banks out of the water but within two feet of the water edge. In the water it is found commonly on water-grass stalks a few inches above or beneath the surface near the shore. It never occurs on the main canals around Soochow but on the small and especially on the terminal branches. Its almost constant absence from the rice fields is due to their height above the water level. There appears to be a marked seasonal variation in the habit of this snail, for in cold weather it could not be found in localities where it had been abundant previously. The authors have found that the geographical distribution of the molluscan carrier is wider than the known endemic areas of schistosomiasis.

R. T. L.

FAUST (Ernest Carroll) & MELENEY (Henry Edmund). **The Life History of** *Schistosoma japonicum* **Katsurada.** *China Med. Jl.* 1923. Sept. Vol. 37. No. 9. pp. 726 734. With 4 figs.

This paper describes the morphology of *S. japonicum* egg and miracidium as found in the Yangtze valley. It states that the carrier in the Soochow district is *Hemibia schmackeri* which apparently is a species of *Oncomelania* close to *hupensis*. In experimental infections the miracidium becomes a sporocyst in about five days. The daughter sporocysts begin to form in three weeks. Cercariae are produced in the ninth week. The process of invasion of the skin is described and in some cases appears to extend over a period of two days. The average cercaria reaches the lung within 48 to 70 hours. The majority thereafter pass onwards through the lung capillaries and reach the systemic circulation. Some penetrate the tissues of the lung reaching the pleura, but these are apparently side-tracked forms. Those individuals which pass through the arterial circulation into channels other than the hepatic portal system are unable to secure proper nourishment and degenerate, thus becoming emboli and acting as toxic elements. Possibly this assumption accounts for the urticarial rash. The greatest development of the young worm occurs from the 14th to 19th day. Sexual differentiation and mating was observed as early as the 17th day, although sexual maturity is not reached before the 30th day. The authors emphasize the importance of skin infection and affirm that "it is no more than theoretically possible for the cercariae to penetrate through the oral mucosa," but do not give reasons for this view.

R. T. L.

MENDOZA-GUAZON (Maria Paz.). [In English and Spanish.] **The Probable Endemicity of** *Schistosomum japonicum* **in the Philippine Islands. La probable endemicidad del** *Schistosomum japonicum* **en Filipinas.**—*Jl. Philippine Islands Med. Assoc.* 1922. Jan.-Feb. Vol. 2. No. 1. In English, pp. 1- 6. In Spanish, pp.31–36. With 1 fig. [22 refs.]

To the 21 previous records of *S. japonicum* in the Philippines the author adds nine additional cases observed between 1912–1922. Seven of these were from Manila, but these may have been transients and acquired infection elsewhere. Two were from the island of Samar, from which 7 previous records occur in the total of 21. None of the new cases were diagnosed antemortem. The author recounts the recent work on the life history of the worm and on pathology of the disease, in view of the likelihood that the infection may prove to be more prevalent than hitherto has been supposed.

R. T. L.

DAY (H. B.). **The Out-Patient Treatment of Bilharziasis, with an Analysis of 1,000 Cases.**—*Lancet.* 1921. Mar. 12. pp. 525–529. With 6 charts and 1 text fig. [5 refs.]

Seeing that 80 per cent. of the agricultural population of Egypt are infected with schistosomiasis, in-patient treatment is impracticable. To overcome the difficulty a tent-annexe was erected at the Kasr-el-Aini hospital to test the efficacy of out-patient treatment. By this means between 100 and 200 cases could be dealt with monthly, and the author here places on record an analysis of the first 1,000 patients suffering from active infection. Of these there were 897 males and 103 females, and 118 were under the age of ten years. 87·5 per cent. were cases of urinary infection. A 6 per cent. solution (1 grain in 1 cc.) of tartar emetic was employed and injected intravenously. The initial dose was 1 grain, the second 1½ gr., subsequent doses 2 gr., administered on alternate days, the duration of treatment being controlled by the effect on the ova. As a rule nothing was observed till the eighth day. Charts are plotted which show graphically the days of administration, the doses given, and the percentage of dead ova found on examination.

An intensive course, totalling 8 9 grs. in the first week, seemed to give excellent results, but it was found that two or three months later ova were again present, although re-infection could be ruled out. It appeared that 13 gr. was the smallest curative amount, and usually 24 gr. or more were needed. In other words, the primary effect of antimony in schistosomiasis is the destruction of the ciliated embryos within their shells, the parent worms requiring a larger lethal dose.

Colloidal antimony was also tried; this has the advantage that it can be given intramuscularly, but the dose for adults is comparatively large (5–10 cc.). Emetine also proved effectual, but here, again, large doses, up to 3½ gr. for each injection, are needed, and, owing to its irritant action on the tissues, it is best given intravenously. Its cost, however, is almost prohibitive as a routine treatment for out-patients, but it is of service for patients who are intolerant of tartar emetic, and for cases complicated by amoebiasis.

To obtain the best results from a prophylactic point of view the peasantry must be awakened to an intelligent knowledge of the disease; hence the value of systematic instruction in schools and the use of posters and kinematograph films.

H. H. S.

CAWSTON (F. G.). **The Treatment of Bilharzia Disease in Natal.**—*S. African Med. Rec.* 1923. Oct. 27. Vol. 21. No. 20. pp. 472–475.

Bilharzia patients are more disposed to the formation of renal calculus and to appendicitis than others. Later experiences show that treatment with intramuscular emetine or intravenous antimony must be continued for at least 28 days to produce permanent cure in a vast majority of cases. The potassium salt of antimony has proved the most serviceable in all cases except where intravenous medication is contra-indicated, as in children. Dissolved in saline the antimony salts are much less toxic than in distilled water. Lack of toleration is seldom met when not more than 1½ grain doses are used. Rarely depression or increased albuminuria towards the end of the third week renders the suspension of treatment for a while desirable. With emetine ½ to 1½ grains intramuscularly on alternate days is apt to produce cardiac depression, which may be overlooked if the patient be confined to bed. The use of 1 per cent. rhenol and an occasional hot sea-water bath prevents irritability from the local discomfort of the injections in young children. Larger doses of emetine or too rapid increase in the dose of tartar emetic may induce vomiting. Tables are given showing two series of cases treated with emetine and tartar emetic.

R. T. L.

PHEASE (R. N.). **Report on the Efficiency of the Treatment of Bilharziosis by Intravenous Injections of Antimony Tartrate, after Two Years.**—*Jl. Roy. Army Med. Corps.* 1923. Sept. Vol. 41. No. 3. pp. 206–209.

Forty-four cases of active bilharziasis were detected in the 2nd Battalion Royal Ulster Rifles on their arrival in Egypt from Mesopotamia in May 1921, and during the following 7 months 57 further cases developed. All were treated with intravenous injections of tartar emetic and 10 grains of urotropin t.d.s. The average number of days under treatment amounted to 44 approximately and the average amount of tartar emetic amounted to 10·9 gr. The immediate effects were eminently satisfactory, but in 20 per cent. of the cases the cure was not permanent. The author considers that all cases should be kept under observation for at least two years after discharge from hospital.

R. T. L.

NOGUE & BOULAY. **Note préliminaire sur l'insuffisance rénale chez les bilharziens. Essais de traitement par l'émétique.**—*Bull. Soc. Path. Exot.* 1923. July 11. Vol. 16. No. 7. pp. 564-566.

The authors tested 24 patients infected with schistosomes, 22 with *S. haematobium* and 2 with *S. mansoni*, as regards renal insufficiency and the effects of injections of tartar emetic upon them. The figure relied upon was Ambard's constant. In 15 of the cases this was in the neighbourhood of 0·115. Those with a high constant (*e.g.*, those with definite chronic nephritis and oedema) bore the drug remarkably well; the anasarca disappeared and, in some, the constant became normal; in others, although the figure remained the same, the oedema receded. The course of treatment was prolonged, a total of 1·3 gm. being given to one nephritic patient, who left the hospital cured.

H. H. S.

PEDERSON (James). **Report of a Case of** *Schistosomum haematobium.*—*Jl. of Urol.* 1923. Aug. Vol. 10. No. 2. pp. 175–180. With 2 figs.

This is a brief report of a lad, 17 years of age, who had suffered from intermittent haematuria since the age of 10 years when he returned to the United States from South Africa. Ova of *S. haematobium* were found in the urine and tartar emetic was injected intravenously, beginning with 0·5 gr. and increasing to 2·75 gr. In all, 25 injections were given during a period of two and a half months, and no ova have been found since the twelfth injection. [The total amount of the drug used is not stated, and by mistake on p. 177 the maximum dose is given as 2·75 grams.]

H. H. S.

POMME & ABDEL-KADER-SABBACH. **Un cas de bilharziose vésicale à Damas, traité par l'antimoine en injections intraveineuses.**—*Arch. Méd. et Pharm. Milit.* 1923. Mar. Vol. 78. No. 3. pp. 290 293.

The case is recorded of a Syrian, 20 years of age, suffering from urinary schistosomiasis. He had never been away from Damascus, a district previously said to be free from bilharzia. Treatment by tartar emetic intravenously gave excellent results. The initial dose was 3 cgm., the maximum 12 cgm., thirteen injections were given in 19 days, the total quantity of the drug being 1·2 gm.

H. H. S.

BONNET (M.). **Un cas de bilharziose vésicale traitée par less injections intraveineuses d'émétine.**—*Jl. d'Urol.* Paris. 1921. July. Vol. 12. No. 1. pp. 15–18.

A detailed account is given of a Senegalese, aged about 25 years, suffering from urinary schistosomiasis and treated by intravenous injections of emetine.

On cystoscopic examination the "bilharzial granulations" were seen to be very numerous in the region of the trigone, 15 per field. There was an eosinophilia of 28 per cent., but ascaris and trichuris were also present. The initial dose of emetine was 2 cgm. and the dose was increased every other day till at the ninth injection 10 cgm. were given. Six more injections of 10cgm. were administered on alternate days, a total of 1·14 gm. The patient now complained of giddiness. For six days the drug was stopped; the eosinophilia was now 6 per cent. The emetine was then restarted, 10 cgm. every three days, but after five injections the patient developed pleurisy and no more was given. The action on the ova was as follows: At first they contained living miracidia, but by the time the fifteenth injection was given there was no more haematuria and the eggs passed were degenerate and had fragmented shells. The cystoscope revealed small patches of dirty yellow colour beneath the mucosa consisting of dead ova. The patient remained in hospital for a month after the last injection, but neither blood nor ova were again found in the urine and the eosinophilia had come down to 4 per cent.

The author regarded emetine administered intravenously as the best treatment for bilharziasis.

H. H. S.

ESQUIER (A.). **Traitement de la bilharziose vésicale par le novarsenobenzol.**—*Congrès de la Santé Publique et de la Prévoyance Sociale, Marseille. 11–17 Septembre, 1922. Comptes Rendus.* pp. 99–104.

The author records three cases of urinary schistosomiasis treated by intravenous injections of novarsenobenzol. Two courses were given to each, the doses of the first course increasing from 0·05 or 0·1 gm. to 0·9 gm., and the duration 5–6 weeks. An eosinophilia of 37 was reduced to 4 per cent. in one patient, to 3 per cent. in another. The improvement, both local and general, was great, but in each case a second course was administered some 4–5 weeks after the termination of the first, the initial dose now being 0·3 gm. and the maximum 1·2 gm. None of the patients gave any untoward reaction after the injections. The masses still seen in the bladder wall by cystoscopic examination consisted of dead ova.

H. H. S.

FAUST (Ernest Carroll). **Treatment of Schistosomiasis japonica.**—*China Med. Jl.* 1923. Oct. Vol. 37. No. 10. pp. 847-849. [6 refs.]

The paper is one intended to advise those proposing to give preparations of antimony for the cure of Asiatic schistosomiasis. It briefly summarizes published work by others and does not include new observations.

R. T. L.

TANABE (Bunshiro). i. **The Life History of a New Schistosome,** *Schistosomatium pathlocopticum* **Tanabe, found in Experimentally-infected Mice.**—*Jl. Parasit.* 1923. June. Vol. 9. No. 4. pp. 183-198. With 7 plates. [14 refs.]

——. ii. **Complement-Fixation Test of** *Schistosomatium pathlocopticum* **and its Group Reaction with** *Schistosoma japonicum.*—*Ibid.* pp. 230-233. [4 refs.]

i. Specimens of *Limnaea palustris* in the neighbourhood of Boston are infected with a furcocercous cercaria with a pair of pigmented eye-spots, six pairs of flame-cells and three pairs of cephalic glands. Young mice were experimentally infected, and the adults obtained were found to belong to a new genus and species named and described in this paper as *Schistosomatium pathlocopticum.* The normal host is unknown.

ii. By employing as antigen an alcohol extract of *Limnaea palustris* infected with the cercaria of *Schistosomatium pathlocopticum* complement-fixation tests were definitely positive for a white rat which had been experimentally infected 5 months previously with this parasite. The test was weakly positive for two white rats experimentally infected 5 weeks previously with *S. japonicum* This confirms the view that the reaction is a group one applicable to other species of schistosomes than that producing the infection.

R. T. L.

YAMADA (Shiro). **Supplementary Contribution to the Study of** *Sparganum mansoni,* **Cobbold.**—*Osaka Igakkwai Zasshi,* (*Jl. of Osaka Med. Soc.*). 1923. Feb. Vol. 22. No. 2. [Summarized in *Japan. Med. World.* Tokyo. 1923. Aug. 15. Vol. 3. No. 8. p. 191.

The worm, which occurs in the muscle of the frog, does not develop into an adult form in the gut of the dog, nor does infection follow when the dog has been fed with the infested cyclops containing onchospheres. The dog is the second intermediary in whose subcutaneous tissues or muscles the worm attains its full development. If the Sparganum as found in the tissues of the dog were fed to another dog it would develop into adult form in the gut of the latter. Sparganum in man may arise (*a*) by taking raw flesh of domestic fowl infested with sparganum and (*b*) by drinking fresh water containing the infested cyclops. It requires two intermediaries, firstly cyclops and secondly fowls, snakes, dogs, cats, swine, monkey, man and other carnivorous animals and as the final hosts the cat, dog and probably other carnivorous animals.

R. T. L.

MILLS (Ralph G.). **Notes on the Occurrence of** *Taenia saginata* **in North China.**—*Jl. Parasit.* 1923. June. Vol. 9. No. 4. pp. 214-220. [7 refs.]

Twenty-five years ago infestation with *Taenia saginata* was common in North China, but according to FAUST such infection occurs rarely in Peking and the vicinity to-day. The author is of opinion that this is an erroneous assumption. From unofficial statements it would appear that about 15,000 cattle are brought annually within the walls of Peking for consumption, *i.e.*, one for 80 persons. When the allowance for 3,000 foreigners, numerous wealthy Chinese and for hotels, etc., is deducted the proportion for the ordinary Chinese population is very much less. Out of 4,500 hospital cases examined in the Peking Union Medical College during a period of two years, 12 harboured or were suspected of harbouring *T. saginata*. Ten were orientals and two were foreigners, and all had contracted the infection in Peking. Chinese methods of preparing beef are apparently fairly effective in most cases, but suspicion rests on the restaurants as the source of occasional infections. The author reports the finding of *Cysticercus bovis* in beef offered for sale in Peking. A good deal of medicine for the treatment of tapeworm is sold on the street or in the fairs from itinerant drug merchants and relatively little by the established native drug shops.

R. T. L.

WOODLAND (W. N. F.). **The One-Host Life-Cycle of** ***Hymenolepis fraterna*****, Stiles, of the Mouse.** Correspondence]—*Nature*. 1923. Sept. 22. Vol. 112. No. 2,812. p. 436.

The experiments of GRASSI, and more recently of JOYEUX, which showed that *Hymenolepis fraterna* of the mouse is capable of undergoing its larval development in the intestinal mucosa of the same species of host, have been repeated by the author and their conclusions verified.

R. T. L.

FERGUSON (James) & TEDHOPE (G. Ranken). **Two Cases of** ***Dipylidium caninum*** **in Children.** *Lancet*. 1923. Oct. 13. p. 828. 5 refs.]

Both cases recorded are from Scotland. The first was a bottle-fed baby and the segments were first observed in the stools during the fifth week of life. The second case was 5½ months old.

R. T. L.

NEVE (Ernest F.). **A Case of Hydatid Cysts of both Lobes of the Liver.**—*Indian Med. Gaz.* 1923. Aug. Vol. 58. No. 8. pp. 380 381.

A Mahommedan boy, 12 years of age, was admitted to the Kashmir Mission Hospital with a tense elastic swelling of the left lobe of the liver and a deep-seated mass in the right hypochondrium. The patient was jaundiced and suffered also from a certain degree of night-blindness. Operation showed that both swellings in the liver were due to hydatids. The author calls attention to the presence of night-blindness with impairment of liver function, and in this connexion mentions a previous case in which cirrhosis of the liver was associated with the same symptom.

H. H. S.

FAIRLEY (K. Douglas). **The Investigation of the Immunity Reactions in Hydatid Disease. A Preliminary Report.**—*Med. Jl. Australia.* 1923. July 14. 10th Year. Vol. 2. No. 2. pp. 27–37. [10 refs.]

This investigation was undertaken with a view of finding a reliable test less intricate than that of complement fixation for the diagnosis of hydatid disease. The author discusses three tests :—1. The absolute eosinophile count, 300 per cmm. being regarded as the limit of the normal. 2. The Precipitin test. 3. The Intradermal test of CASONI.

The first is of doubtful value, as there are several other causes of eosinophilia, all of which would have to be excluded; it is useful, however, as an auxiliary sign.

The second proved very nearly as reliable as the complement fixation reaction and has the additional advantage that a carbolized antigen (1 vol. of 5 per cent. carbolic acid added to 10 vol. of fresh hydatid fluid from the sheep) retained its properties for at least six months. For the test 0·4 cc. of antigen is placed in a small tube such as is used for macroscopic agglutination reactions, and an approximately equal amount of the patient's serum is added. No shaking is needed and the mixture is left at room temperature for 30–36 hours. In a series of 69 tests 52 were positive by the precipitin reaction, 56 by that of complement fixation.

For the Casoni test 0·5 cc. of filtered hydatid fluid (obtained from cysts of sheep or human patients and passed through a Berkefeld filter and stored in ampoules or vaccine bottles in the ice-chest), to which had been added pure phenol in the proportion of one drop to 20 cc. fluid, is injected intradermically. In positive cases there ensues in a few hours oedematous infiltration, local heat, sometimes redness and itching, which usually passes off in 48–72 hours, but in severe cases the signs may persist for a week. Of 72 proved cases 40 gave a positive reaction. Different fluids vary considerably in their potency ; that obtained from one patient failed to give any positive reaction even in proved cases. Further, the test may be negative even years after operation in spite of the fact that a second cyst is present. On the other hand, the result was invariably negative in non-hydatid patients, and was occasionally positive when the precipitin and complement fixation tests had given a negative. The Casoni test was negative if the cyst had suppurated, whereas the other two serological tests gave marked positive results under these circumstances.

In his summary of conclusions the author states as regards the precipitin test that it " gives results practically identical with those of the complement fixation test . . . . it can easily be done without any special preliminary laboratory training."

H. H. S.

PATTERSON (S. W.) & WILLIAMS (F. E.). **Preliminary Note on a Stable Antigen for the Hydatid Complement-Fixation Test.** —*Med. Jl. Australia.* 1923. Nov. 3. 10th Year. Vol 2. No. 18. p. 467. [2 refs.]

Alcoholic extracts of hydatid scolices have considerable antigenic value, but, unfortunately, give pseudo-positive reactions with syphilitic sera. By evaporating off the alcohol at room temperature and taking up the residue in distilled water or 0·9 per cent. salt solution an antigen is obtained of strong antigenic value which gives no fixation of complement in the presence of syphilitic sera and has kept its properties apparently without diminution for fifteen months.

R. T. L.

ITHURRAT (P. F.) & CALCAGNO (B. N.). **Étude de la valeur comparée des différentes réactions biologiques dans le diagnostic de l'échinococcose.** —*Presse Méd.* 1923. Sept. 5. Vol. 31. No. 71. pp. 765–766.

The authors discuss briefly the results of the tests commonly employed for the diagnosis of hydatid cysts. None appears to be infallible, and it is recommended that complement deviation, intradermal reaction and the eosinophile count should all be performed. From a consideration of the three a correct decision can usually be reached. They place most reliance on the intradermal test, and find, as others have done, that the fluid from an animal cyst gives generally better results than that from a human case. They state that suppuration of the cyst does not affect the reaction. [This is at variance with what was found by K. D. FAIRLEY. See above.]

H. H. S.

DEW (Harold R.). **Observations on the Mode of Development of Brood Capsules and Scolices in the Encysted Stage of** *Taenia Echinococcus*. *Med. Jl. Australia.* 1922. Sept. 30. 9th Year. Vol. 2. No. 14. pp. 381-384. With 18 text figs. [5 refs.]

The exact mode of development of brood capsules, scolices and daughter-cysts in Echinococcus has always been uncertain and the descriptions hitherto given, to say the least, confusing. Dr. Dew in this paper takes up the first two questions and gives a remarkably clear exposition of a difficult subject. The essential point to grasp first is that the brood capsules, daughter-cysts and the laminated layer all develop from the parenchymatous or germinal layer.

1. *Development of Brood Capsules.* These first appear as multiplications of small nuclear masses of the parenchymatous layer. The nodules so formed grow, become vacuolated to form vesicles—the brood capsules from which the scolices develop.

2. *Development of Scolices.* There is a local thickening of the wall of the brood capsule (like the brood capsule itself growing from the cyst wall) and on the inner surface of this the hyaline cuticular material is laid down. As these increase in number the wall of the capsule bulges or evaginates to form a protective cup for the growing scolex. Near the head end the cuticle thickens and a circlet of hooklets develops. As growth leads to the projection of the heads into the cavity and these may be injured or the hooklets knocked off by contact with other scolices, there is a contractile part of the body of the scolex capable of invaginating the head, so that the typical resting position of the scolex has the hooklets inside with the free extremities pointing anteriorly. Each scolex has the definite hyaline cuticle running on to the stalk and adjacent part of the wall of the brood capsule, whereby the latter appears to possess a partial hyaline layer. This, however, is never complete, but has given rise to the notion of a reversal of layers in a brood capsule. Budding from the exterior was never observed [though depicted and described in text books], but if the brood capsules ruptures, which it may with very slight trauma, the thin wall tends to turn inside out and give the appearance of external budding.

The author states that he intends to issue in the future a communication on the development of daughter-cysts. This will be awaited with much interest.

H. H. S.

PORTER (Annie). **On the Effects of Cold on the Vitality of Certain Cysticerci and Echinococci in Meat kept under Commercial Conditions of Freezing in Johannesburg.**—*Publications of the S. African Inst. for Med. Res.* 1923. Feb. No. 16. 49 pp. [12 refs.]

Motility has been applied as the criterion of evidence of life in the case of cysticerci in frozen meat, and it has been concluded that the freezing for three weeks of meat infested with tapeworm cysts is sufficient to destroy the vitality of the cysticerci and prevent their development in man.

These conclusions appear to have been based upon experiments with isolated cysticerci or with relatively small joints of infested meat and may not prove applicable under modern conditions. The author has had facilities in the Johannesburg Municipal Abattoir whereby whole carcases or portions of carcases of infested beef and pork could be stored in freezing chambers for as long as was necessitated by experimental requirements. The freezing was done under ordinary commercial conditions under the personal supervision of the trained veterinary surgeons. As a result of numerous well conceived experiments, which are detailed in the paper, the author concludes that staining especially with methyl green slightly acidulated with acetic acid is the most satisfactory means of testing the viability of *Cysticercus bovis* and *C. cellulosae.* Dead cysticerci stain relatively deeply and rapidly as compared with the living forms. Hydatids of *Taenia echinococcus* frozen for 30, 43, 61 and 70 days when fed to dogs resulted in infection. After being frozen for one month the *Cysticercus fasciolaris* of the mouse developed in its normal definitive host the cat. By analogy confirmed by staining reactions, it is concluded that brief periods of freezing are insufficient to kill *C. bovis* and *C. cellulosae.*

It is suggested that " a period of at least 12 weeks freezing of slightly infested beef or pork at a temperature of 14° F. (*i.e.* = 10° C.) should be undergone before the meat may be regarded as sterile and the cysticerci as dead." Where heavy infestations occur the carcase should not be used for human food even after this period and would be more satisfactorily disposed of if sent to the inedible-tallow factories.

R. T. L.

THIRA (Tokuzo). **Studien über** *Strongyloides stercoralis.—Mitt. d. Med. Gesellsch. z. Tokio.* 1919. June. Vol. 33. No. 11. pp. 2–3.

As the result of the examination of the intestines of two human cases of infection with *Strongyloides stercoralis* and of animal experiments carried out on cats and apes the author draws the following conclusions:—1. If the parasites are present in sufficient numbers they injure the mucosa and lead to the formation of ulcers and general ill-health ; 2. The rhabditiform larvae from the parasitic form can penetrate equally as well as those from the free-living ; 3. Some of the rhabditiform larvae may be transformed into the filariform *within* the body and these can be seen in the muscularis, in the lymph vessels and in the veins of the submucosa, and thus auto-infection is possible ; 4. The site of penetration by the filariform larvae may remain open for some time and other larvae and bacteria in large numbers may enter by the same route ; 5. A dog was infected by rectal injection of filariform larvae contained in a *fresh* stool.

[A series of 35 microphotographs is presented to illustrate some of these points, but the fuller paper and the remarks on the illustrations are unfortunately in Japanese, but, if the above findings are confirmed, our present ideas on the life-history of this parasite will need revision.]

H. H. S.

THOMAS (Erich). **Ueber Darmerkrankungen durch** *Strongyloides intestinalis.* [Bowel Infection with *S. intestinalis.*]—*Deutsch. Archiv. f. Klin. Med.* 1922. Dec. Vol. 141. Nos. 3 & 4. pp. 129–150. [38 refs.]

The author records a human case of infection by *Strongyloides intestinalis* and brings forward arguments to show that it is by no means always a harmless parasite, but may cause definite and, at times, severe symptoms—intermittent abdominal pain, diarrhoea with mucoid and sanguineous stools, eosinophilia (12–18 per cent.), perhaps rise in temperature and some degree of secondary anaemia. In this case other infections, such as concomitant ankylostomiasis or disease due to typhoid or paratyphoid organisms, were excluded and the condition cleared up after administration of large doses of thymol. 1 gm. daily was given at first, but 10 gm. daily were needed before the stools were found free of larvae.

H. H. S.

CRUICKSHANK (J. A.), CUNNINGHAM (J.) & IYER (T. Seethapathy). **Studies in Filariasis. No. 1. A Filarial Survey with a Statistical Enquiry into the Relationship between Filariasis and Elephantiasis.** —*Indian Jl. Med. Res.* 1923. July. Vol. 11. No. 1. pp. 79–91. [3 refs.]

The proximity of the King Institute, Guindy, Madras, to a heavily infected area—the village of Saidapet—has provided an opportunity of re-investigating the question of the relationship of filarial infection to elephantiasis. A statistical survey was made of the whole village in the course of which 1,510 persons were examined, of whom 738 were males and 772 females. The results have been tabulated in exact accord with the STEPHENS' (1920) scheme and the results are shown to be at variance with those obtained by STEPHENS. In Southern India it has been found that (*a*) microfilariae are less commonly found in those with the recognised signs of filarial disease than in those without these signs ; (*b*) the signs of filarial disease are less frequent among those infected with microfilariae than among those not so infected ; (*c*) the microfilaria rate in cases of elephantiasis is very much lower than that recorded in Fiji ; (*d*) the proportion of persons affected with elephantiasis regularly increases with age. The results in this paper tend to confirm the view that possibly there are differences in the pathological effects produced by filariae in different areas.

R. T. L.

LE CHUITON. **La filariose à Saigon ; observations prises à la caserne des marins.**—*Arch. Méd. et Pharm. Nav.* 1923. June-July. Vol. 113. No. 4. pp. 294–312. [10 refs.]

Filariasis has usually been considered a rarity in Saigon. In November 1922 the author found filarial embryos in milky fluid obtained from a hydrocele and consequently made systematic examinations of the inmates of the barracks and found 15·47 per cent. infected. Of each of these brief details are given. Though the disease appears to have increased since the first case was recorded by Noc in 1907, it has probably been overlooked because the cases are usually mild, exhibiting mainly small lymphatic varicoceles, while the more obvious manifestations—lymph-scrotum, chyluria, elephantiasis—are not met with. Filariasis undoubtedly exists in Cochin-China since 8 of the 15 had never been out of the country. Differential leucocyte counts were made of each of the cases recorded and the proportion of eosinophiles was found to vary between 5 and 24 per cent., with an average of 11·53.

H. H. S.

GUZMÁN (P. A.). **Contribución al estudio de la Filariasis en Venezuela. Filariasis de Bancroft.**—*Gac. Méd. de Cacaras.* 1923. Mar. 15. Vol. 30. No. 5. pp. 65–69. [11 refs.]

The main object of this paper is to point out the extensive prevalence of filariasis in Venezuela. Seven cases are recorded. In six of these, suffering respectively from chyluria, haematochyluria, chylous diarrhoea, chylocele, abscess of the thigh, and varicose groin glands, filarial embryos were found in the blood of the patients and of others in the family also. Six cases of elephantiasis are mentioned, one in detail, but in none of these was the embryo discovered.

H. H. S.

YAMADA (Shinichoro). **[Descriptions of Ten New Species of** *Aëdes* **found in Japan, with Notes on the Relation between some of these Mosquitoes and the Larva of** *Filaria bancrofti* **Cobbold.]**—*Annot. Zool. Jap.* 1921. Vol. 10. Art. 6. pp. 45–81. With 4 text figs. [Summarized in *Japan. Jl. Zool.* Tokyo. 1922. Vol. 1. No. 1. (Abstracts.) p. 5.]

Of 13 species of Aëdes examined by the author *Aëdes togoi*, a very common species in Japanese territories, proved able to serve as an intermediary for *Filaria bancrofti*, while partial development to a certain degree occurred in *A. galloisi*, *A. chemulpoensis* and *A. esoensis*. As a general rule, however, the species of Aëdes are resistant.

R. T. L.

SHATTUCK (George Cheever). **A Case of Filariasis apparently contracted in Boston.**—*Boston Med. & Surg. Jl.* 1923. July 26. Vol. 189. No. 4. pp. 142–144. [5 refs.]

A white woman, 25 years of age, born in Charlestown, Massachusetts, who had never travelled far from Boston, came to hospital with elephantiasis of the left leg. Filarial embryos were found in the blood taken at midnight. The author refers to his previous paper on sporadic elephantiasis in Boston [*Boston Med. & Surg. Jl.* 1910] and briefly discusses the possible origin of this case.

Culex fatigans is the transmitter of filariasis in Charlestown, the one active endemic focus in the South, but the common mosquito of Boston is *Culex pipiens*, which can convey the disease in China and may have done so in the present instance. [See also this *Bulletin*, Vol. 20, p. 751.]

H. H. S.

VAIDYA (B. A.). **Filarial Haemoptysis.** [Correspondence.]—*Indian Med. Gaz.* 1923. Sept. Vol. 58. No. 9. p. 450.

The author states that he has knowledge of a case of haemoptysis similar to that reported by Dr. BANERJEE. A medical student had severe haemoptysis and was suspected as a case of tuberculosis. The late Dr. N. F. SURVEYOR diagnosed the case from the blood examination as one of filariasis. The patient ultimately recovered under symptomatic treatment.

R. T. L.

ADLER (S.). **Carbon Tetrachloride in Filariasis.**—*Ann. Trop. Med. & Parasit.* 1923. Oct. 13. Vol. 17. No. 3. pp. 427–429.

In view of the success obtained by the oral administration of carbon tetrachloride in patients infected with intestinal nematodes the effect of intramuscular and intravenous injections of the same drug was tested in patients with filariasis. Experiments were first carried out on dogs to determine dosage. Death resulted from embolism if the carbon tetrachloride was not mixed for intravenous injection with twice its volume of ether. The dose for intramuscular use varied from 0·5 cc. to 2 cc., three injections being given as a rule at five-day intervals; the dose for intravenous injection was 1 cc. carbon tetrachloride with 2 cc. ether.

Local pain, passing off in 5–10 minutes, resulted from intramuscular injection, while with intravenous administration severe coughing was set up and later drowsiness, but whether this latter was due to the tetrachloride or the ether could not be determined. There was no albuminuria or other ill effect, but neither was there any marked diminution in the number of filarial embryos found in the blood. The author suggests that the method should be tried for adult filaria, as *Loa loa*. He has not yet had an opportunity of doing this himself.

H. H. S.

SHARP (N. A. Dyce). *Filaria bancrofti* **and** *Loa loa*. **A Note on some Methods of Differentiation of their Embryos.**—*Trans. Roy. Soc. Trop. Med. & Hyg.* 1923. June 21. Vol 17. No. 3. pp. 177–191. With 1 coloured plate.

The adult male population at Kaduna, the capital of Northern Nigeria, shows a microfilaria infection rate of over 45 per cent. 1,026 individuals, forming ⅓ of the total population, were examined and the blood of 400 of these was also taken at night. Of the total number examined 161 showed *F. bancrofti*, 79 *F. loa* and 280 *F. perstans*. One embryo of *O. volvulus* was seen, but the author supposes that it had escaped from the skin at the site of the puncture.

The paper shows the differential value of vital staining with methylene blue. A drop of blood is placed upon a drop of methylene blue (1 in 5,000). If the embryo be that of *Loa loa* it usually begins to take up the stain within ten minutes and becomes most active. If it be the embryo of *Filaria bancrofti* no stain is absorbed for three or four hours and then only at the V spot. After about half an hour in 1 in 10,000 methylene blue the living loa embryos show a very dark blue core. They usually die within three or four hours, by which time the whole worm is blue. The excretory V spot in about 20 per cent. of the cases is of such proportions as to double or treble the diameter of the worm. The staining varies in different individuals. Interesting differences are also noted when the blood embryos are fixed and stained in 1 in 30 Giemsa for six to twelve hours. By this technique the loa embryos appear much thinner and more deeply stained than those of *F. bancrofti* and the sheath is not visible. Numerous other differences of detail are noted in the paper. The Giemsa method enables one to further differentiate the "greater" and "lesser" *Microfilaria perstans* hitherto distinguished only by size. Although *Filaria bancrofti* embryos occur in the blood of 16 per cent. of all males in Kaduna no case of elephantiasis has come under the author's notice during a stay of fifteen months. Hydrocele is, however, common and the fluid almost always contains embryos.

The paper concludes with some clinical notes of cases.

R. T. L.

KIMBERLIN (J. W.). *Filaria loa.* **Report of Case of Removal from the Subconjunctival Tissues.**—*Jl. Amer. Med. Assoc.* 1922. Nov. 17. Vol. 81. No. 20. pp. 1685–1686. (Discussion pp. 1686–1687.) [10 refs.]

After a somewhat lengthy review of the literature and of records of imported cases in America, the author describes the clinical appearances of a case in one who had spent some time in Africa. The only point of noteworthy interest lies in a statement by Dr. A. BARKAN, San Francisco, to the effect that he had 30 or more years ago reported in one of the early volumes of KNAPP's *Archives of Ophthalmology* a case in which he had removed a *Filaria medinensis* [?] from the pupil of the eye of a man from Australia. There were no particular symptoms, nor was there pain or irritation, but there was "a pretty little white thread floating about in the anterior chamber" which was floated out through an incision under physostigmine.

R. T. L.

LOW (GEORGE C.). **The Aetiological Relationship of** *Loa loa* **to Calabar Swellings.**—*Jl. Helminthology.* 1923. Sept. Vol. 1. No. 4. pp. 191–192.

In two cases of Calabar swellings which did not show embryos in the blood the author has examined the serum obtained by puncture of the swellings, carrying out in detail the technique suggested by MANSON. The conclusion reached is that it is unlikely that the swellings are due to an adult female giving birth to young embryos. The possibility that the death of the adult worm may be the immediate cause of the swellings is mooted.

R. T. L.

CORSON (J. F.). **The Occurrence of the Larvae of** *Onchocerca volvulus* **(Leuckart, 1893) in the Skin of Natives of the Gold Coast.**—*Ann. Trop. Med. & Parasit.* 1922. Dec. 30. Vol. 16. No. 4. pp. 407–420. With 2 plates and 1 fig. [13 refs.]

The larvae of *Onchocerca volvulus* have rarely been found in the blood, but according to the author's observations they occur in numbers in the skin. 290 prisoners at Seccondee, Gold Coast, were inspected; 16 had subcutaneous tumours, and of other abnormal conditions of the skin 24 had lichenification, 1 elephantiasis, 5 craw-craw and 3 thickening of the skin but not localized as in elephantiasis. In 33 signs of scratching were present. 24 of these cases were selected for investigation. A piece of skin about half a sq. cm. was excised from the left lower dorsal region and put into saline. In 15 of these cases larvae of *O. volvulus* were recovered from the sample. A series of measurements is given to show that the larvae from the skin are actually identical with those of *O. volvulus* removed from tumours. No clear causal relationship between the larvae and the conditions of craw-craw, elephantiasis and lichenification was evident in the cases investigated.

R. T. L.

LE DENTU (R.). **Le traitement du ver de Guinée par les injections intraveineuses d'émétique.**—*Bull. Soc. Path. Exot.* 1923. July 11. Vol. 16. No. 7. pp. 566–567. [1 ref.]

The author treated 30 patients suffering from guineaworm with daily intravenous injections of tartar emetic, 2–3 cc. of 2·5–3 per cent. solution. Though not infallible the drug gave on the whole very encouraging results. In 14 cases complete expulsion of the worm followed (2 after the first injection, 2 after the second, 4 after the third, 3 each after the fourth and fifth). In ten patients, although the worm remained, the inflammatory phenomena disappeared. In the other six there was no change.

H. H S.

PEYROT (J.). **Délire onirique et filaire de Médine.**—*Jl. de Méd. de Bordeaux.* 1923. Nov. 25. Vol. 95. No. 23. pp. 940 941.

A remarkable case of delusional insanity in a native soldier in whom, after he had been in hospital under observation for a week, a guineaworm was seen making an opening in the middle third of the right leg. It was removed at two sittings on consecutive days by traction after local application of chloroform, and the symptoms rapidly and entirely cleared up. There was no sign of any other disease, the Wassermann reaction was negative, and the case is regarded as an unusual instance of toxic psychosis.

H. H. S.

YOKOGAWA (Sadamu). **On Ascariasis and the Life-History of Ascaris.**—*Taiwan Igakkai Zasshi* (*Jl. Med. Assoc. Formosa*). 1923. July. No. 229. pp. 1–18. With 9 plates.

Provided the temperature is suitable development takes place in the Ascaris egg not only under relatively dry conditions but even in absolutely dry surroundings, although in the latter case death occurs during or after the formation of the embryo. Disinfection of faeces containing Ascaris can be accomplished by heat. The use of boiling water for washing edible vegetables and fruits is advocated.

In the hatching of the egg digestive juices do not appear to play a part. What are essential are full development of the embryo, suitable temperature, and peristaltic motion of the intestine to stimulate the movement of the embryo within the egg. There is a conspicuous accumulation of eosinophil cells wherever the Ascaris larvae are found. The author has studied afresh the migratory course of *Belascaris marginata* larvae in the bodies of experimentally infected dogs and mice. He notes that in the intestinal wall the majority of the larvae are in the lymphatics or blood capillaries: around those free in the muscular coat there is strong inflammatory infiltration, and these are found to be dead after several days. The larvae migrate from the intestine by the lymphatic circulation to the mesenteric lymphatic nodes and so reach the right side of the heart. The larvae which migrate into the abdominal cavity by piercing the gut are only a minority which pass to the lungs by piercing the surface of the liver and so reach the hepatic veins. It is very rare that the larvae pierce the diaphragm and so reach the lungs through the pulmonic pleura.

Various pathological changes, due to Ascaris at an early stage of infection, were noted in various internal organs in stray dogs. In 70 per cent. of 141 there was a peculiar pathological change caused by the larvae entering the kidneys. These changes were studied more fully in experimental animals.

In the intestinal wall in slight infections no changes were recognised, but in intense infections the surface of the mucosa was generally swollen and had dot-like haemorrhages with congestion on the serous surface. Microscopically, tubercles were found due to larvae surrounded by polynuclear leucocytes, eosinophils, epithelioid and lymphatic cells. In lymphatic nodes intense hyperaemic and dot-like haemorrhages occur, with peculiar small white spots where the infection is very intense. Microscopically, it is seen that the larvae may destroy the lymphatic follicles in their neighbourhood, producing inflammatory infiltration, clots of fibrin and degeneration of the tissues. In the liver in intense infections there is heavy congestion, and dot-like or irregular spot-like small haemorrhages are frequently recognised after 2 to 5 days, while as time progresses there are greyish white spots of submiliary size. Microscopically, exudations and localized small haemorrhages occur due to rupture of the interlobular capillary plexus.

In the lungs are subpleural haemorrhages, or in small animals with intense infections haemorrhage in part or the whole of the lung, sometimes causing suffocation. In larger animals these heavy haemorrhages do not occur, but the pleura of the lung may become speckled by the gradual fusion of bleeding foci. As the agent, origin, and appearance of the pneumonia caused by these larvae differs from other bronchopneumonias the term "*Parasitic Pneumonia*" or Ascaris pneumonia should be used. The pathological changes in the kidney, brain and spinal cord, heart, and in the bone marrow and glands of internal secretion are described in turn. Larvae found in the lungs of a pup two days old suggest intrauterine infection. The author supports the increasingly accepted view that the relative absence of worms in older dogs is due to the development of an immunity.

R. T. L.

MATSUBARA (Kinichi). [**On the Pathological Changes occurring in the Lungs in Homogenous Experimental Ascariasis. (A Preliminary Notice.)**]—*Tokyo Iji Shinshi* (*Tokyo Med. News*). 1923. Feb. No. 2,315. [Summarized in *Japan. Med. World.* Tokyo. 1923. July 15. Vol. 3. No. 7. p. 165.]

The symptoms of pneumonia arising from experimental ascaris infection in dogs are thus distinguishable from other forms of bronchial pneumonia:—the larvae are always found in the foci, haemorrhages are almost always present, no oedematous findings occur in or around the foci, and there is no tendency to pass into necrosis of the exudative substances in the alveoli and bronchi. The condition bears a closer resemblance to hyperplastic inflammation of the lungs.

R. T. L.

FRITZ (Otto). **Askariden des Magendarmtraktes in Röntgenbild.** [Ascaris in the Intestinal Tract revealed by X-rays.] *Fortschr. a. d. Geb. d. Röntgenstrahlen.* 1922. Vol. 29. pp. 591–593. With 2 figs.

An account is given of two cases in which obscure abdominal symptoms were present. X-ray examination revealed ascarides wandering from the duodenum into the stomach, and treatment with santonin resulted in cure.

H. H. S.

REITER (Josef). **Zum Röntgenologischen Nachweis von Askariden in Magendarmtrakt.**—*Wien. Klin. Woch.* 1923. Aug. 16. Vol. 36. No. 33. p. 592. With 2 figs.

Two cases are narrated. One patient was a worker on the railway and had sustained a blow on the abdomen. Owing to the persistence of vague symptoms and the passage of blood laparotomy was about to be performed. X-ray examination showed numerous ascarides in the jejunum and ileum and the condition cleared up after administration of santonin. In the second, who had been operated upon for post-enteric cholecystitis, an ascaris was seen by X-rays to be lying coiled in the stomach.

H. H. S.

MAKAI (Endre). **Ueber Spulwürmerabszesse der Leber.** [Ascaris Abscess of the Liver.] *Deut. Ztschr. f. Chir.* Leipzig. 1922. Mar. Vol. 169. No. 5–6. pp. 297–308. [1 ref.]

An interesting account is given of a girl, aged 7 years, heavily infected with ascaris. After administration of santonin and castor oil on Oct. 19th there were passed on successive days 65 and 15 worms, thereafter for 4 days 8–10 daily. On Oct. 10th santonin had been given but, though a few worms had passed, the condition had not improved. On Oct. 27th the temperature rose to 39·3°C., the pulse was rapid, 130 per minute, and severe pain was complained of in the upper part of the abdomen. The general state became worse and the patient very restless. Sepsis in the liver was diagnosed and liver abscess due to ascarides suspected. At operation on Nov. 2nd. a swelling "the size of a nut," yellowish in colour, was found in the liver; mixed with the pus that was removed were 5 small ascarides, 3 males and 2 females, coiled together, each 3–6 cm. in length, probably 2–3 weeks old. If this is correct, the embryos had reached the liver before the santonin had been administered. No connexion could be made out between the abscess cavity and the bile ducts, and the author thinks that the changes due to lodgement of the parasites in the liver started about the middle of September.

H. H. S.

EICKELBERG (Trude). **Zur Diagnose und Behandlung von Askaris-Erkrankungen.** [Diagnosis and Treatment of Illness due to Ascaris.]—*Deut. Med. Woch.* 1923. Aug. 3. Vol. 49. No. 31 pp. 1020–1021. [3 refs.]

The symptoms associated with Ascaris infection being often vague, the writer made a point of examining the stools of every patient coming to his hospital complaining of gastro-intestinal disturbance. Some of the cases of which he gives brief records had been sent to him with a diagnosis of tuberculosis, owing to their pallor and loss of weight, but they recovered rapidly and completely after a few doses of helminal, ascaris ova having been found on faecal examination. Helminal is the dried extract of *Digenea simplex*, prepared by Merck. The dose for children is one tablet three times a day for two or more successive days; for adults two tablets. If ova are still present when the faeces are re-examined a week later the course is repeated. Helminal usually acts as its own purgative; if it fails to do so a dose of castor oil is given.

H. H. S.

CAIUS (J. F.) & MHASKAR (K. S.). **Notes on Ascaricides.**—*Indian Jl. Med. Res.* 1923. Oct. Vol. 11. No. 2. pp. 377–392. [7 refs.]

Of 19,251 rural inhabitants of the Madras Presidency 55 per cent. harbour roundworms. The infection attains a rate of 85 per cent. in the Moplah community of the Malabar district. The number of worms present in the individual is usually not more than two. As a result of a series of tests with 50 specified drugs the authors conclude that Santonin is the most efficient drug for Ascaris treatment. Chenopodium oil, betanaphthol, thymol and carbon tetrachloride have ascaricidal properties. *Butea frondosa* is the only Indian anthelminthic plant which removes roundworms, and it does not compare with any of the other anthelminthics listed as ascaricidal.

With santonin the limit of tolerance is reached with 6 grains when toxic symptoms such as xanthopsia, giddiness and headache begin to appear ; 5 grains may be taken as the optimum dose and is perfectly safe for adult males and produces no after affects. The efficacy of treatment appears to be enhanced by delaying purgation for 12 hours or longer after the taking of the drug. In its effect on the worm santonin is a weak vermicide but a powerful narcotic. It has no vermifugal action and purgation is therefore necessary. The best method of administration is to give the drug at night and to administer Epsom salts on the following morning. The authors attempt to correlate the action of santonin with its chemical constitution. Seven santonin derivatives were prepared and their anthelminthic property tested against that of santonin. The result shows that the anthelminthic properties of santonin are not correlated with its lactone structure. Further study is necessary to determine which part of the santonin molecule is responsible for its anthelminthic properties.

R. T. L.

YOSHIDA (Sadawo) & TAKANO (Ryozo). [**Some Notes on the Albuminous Coating of Ascaris Eggs.**]—*Osaka Igakkwai Zasshi* (*Jl. Osaka Med. Soc.*). 1923. Feb. Vol. 22. No. 2. [Summarized in *Japan. Med. World.* Tokyo. 1923. Aug. 15. Vol. 3. No. 8. p. 191.]

The albuminous coating of Ascaris eggs swells and disappears in weak hydrochloric acid (0·1 per cent.–0·3 per cent.) and in artificial gastric juice at 35°–37° C. This removal is facilitated by stirring or other mechanical treatment. That some eggs are passed in the faeces without their albuminous coating may possibly be explained by the fact that they have been swallowed. In such cases anthelminthic treatment would of course prove futile.

R. T. L.

NYBERG (C.). [**Blueberries in Treatment of Oxyuriasis.**]—*Finska Läkaresällskapets Handlingar.* Helsingfors. 1923. May–June. Vol. 65. p. 354. [Summarized in *Jl. Amer. Med. Assoc.* 1923. Oct. 20. Vol. 81. No. 16. p. 1,401.]

Fresh blueberries [? Vaccinium] are recommended for oxyuriasis. Large children and adults are advised to eat half a litre of the fresh berries three or four times during the first day and once as a meal for the next six days.

R. T. L.

FÜLLEBORN (F.). **Ueber die Entwicklung von Trichozephalus im Wirte.** [Development of Trichocephalus in the Host.]—*Arch. f. Schiffs- u. Trop.-Hyg.* 1923. Nov. Vol. 27. No. 11. pp. 413–420. [6 refs.]

Experiments with species of Trichocephalus from man, monkeys and rabbits show that when fed to normal hosts the larvae of Trichocephalus do not reach the intestine by the blood-stream route taken by Ascaris, but apparently reach it direct. This is somewhat strange, as the larvae of the related Trichinella normally enter the blood-stream, and, like these, the larvae of Trichocephalus possess a boring oval spear which would appear to be suitable for piercing tissues. For purposes of study the eggs of Trichocephalus may be collected from faeces by means of KOFOID and BARBER's wire loop method, but as the eggs rise to the surface of the salt solution much more slowly than do those of Ascaris and Ancylostoma it is advisable to collect them some 24 hours later. The eggs should not be covered with water but kept on moist filter paper at 26°C. The larvae take from 3 to 3½ weeks to develop fully. The embryonated eggs of *T. trichiura* can be got to hatch in the gut and principally in the caecum of guineapigs, but they only grow from 140 μ to 224 μ, surviving about 4 days.

R. T. L.

FÜLLEBORN (F.). **Ueber den "Mundstachel" der Trichotracheliden-Larven und Bemerkungen ueber die jüngsten Stadien von** *Trichocephalus trichiurus.*—*Arch. Schiffs- u. Trop. Hyg.* 1923. Nov. Vol. 27. No. 11. pp. 421–425. With 18 figs. [10 refs.]

The larvae of Trichocephalus, Trichina, Hepaticola and Trichosomoides all possess an oral " spear " which can be extruded. This may be taken to indicate that the family to which these genera belong has been derived from freeliving forms resembling Tylenchus. The oral spear has a lancet blade and a shaft. The latter is fixed to the oesophagus. The shaft is flattened while the blade is rounded and has an obliquely truncated tip. The armature recalls that seen in Dorylaimus.

R. T. L.

LAMBERT (S. M.). **Methods of administering Anthelmintics to remove Whipworms, with a Note on a New Method.**—*Amer. Jl. Trop. Med.* Baltimore. 1923. July. Vol. 3. No. 4. pp. 297–305. [9 refs.]

Oil of chenopodium has been tried in doses of 1·5 to 2 cc. as an intravenous injection, and so used has apparently had a marked vermicidal action on Trichuris, little on Ascaris, and none on hookworms. The method is not recommended as a routine treatment in view of the crude form of the oil. Injected intramuscularly this drug has little action on hookworms, but in one case apparently had a marked action on whipworms. It is suggested that the possibilities of these novel methods of administration of chenopodium deserve experimental investigation, preferably on dogs and other suitable animals.

R. T. L.

AUGUSTINE (Donald L.), PAYNE (George C.), CORT (William W.), RILEY (William A.), STOLL (Norman R.), HILL (Rolla B.) & PAYNE (Florence King). **Investigations on the Control of Hookworm Disease. Nos. XIX–XXXI.**—*Amer. Jl. Hyg.* Baltimore. 1923. May. Vol. 3. No. 3. pp. 280–295; 315–342. July. No. 4. pp. 416–443. July Supplement. pp. 1–127. Sept. No. 5. pp. 547–597.

*xix. **Observations on the Completion of the Second Ecdysis of** *Necator americanus.* [AUGUSTINE.] pp. 280–295. With 9 text figs. & 1 chart. [13 refs.]

The two ecdyses undergone by the hookworm larva outside the body are distinctly unlike. The first is due to the increasing size of the larva, which eventually breaks from the old skin. After the larva has reached maturity, however, it shrinks in size, and the old skin is retained as the second sheath, which serves as a protective covering unless broken or shed with the aid of outside agencies or during lateral flexures of the body. The author gives in detail experiments and observations on the factors influencing the loss of this protective sheath. In sand the anterior end of the sheath is worn by friction against rough surfaces, while in clay loams it is retained and becomes broken by the onward movement of the larva. The rate of unsheathing is directly related to the texture of the soil.

These unsheathed larvae are less resistant to unfavourable conditions but are infective and successfully pierce the skin. The adult reared from sheathed and unsheathed larvae do not differ in daily egg output.

xx. **Human Infestation Studies in Porto Rico by the Egg-counting Method.** [PAYNE (George C.), CORT & RILEY.] pp. 315–338. With 7 text figs. [10 refs.]

The worm-count method of DARLING is the most accurate now available for the determination of the infestation of individual patients, and it has given valuable information on the relative value of different anthelminthics, on the distribution of the different species of human hookworms, on the worm index of various population-groups, and on the evaluation of the results of control measures. It is, however, very expensive and time-consuming. The radical treatment necessary tends to prejudice the people against the remedy in the early surveys, even if there are no accidents. It frequently involves the payment of patients, which is a serious obstacle to the subsequent widespread treatment of primitive peoples. It is, however, just as important to know the number of eggs being deposited on the soil by individuals as to know the number of adult hookworms they harbour. In the studies in Porto Rico reported by the authors of this paper the technique introduced by Stoll for egg-counting was utilized. The output of eggs of any given population-group is a measure of the potential dissemination of the parasite, and this information, as obtained by egg-counts, is of importance in planning control measures. The males in the population had a considerably greater average egg output between the ages 20–45 than the females, although in the most heavily infested area the female output was higher. Arranged in age-groups the youngest showed a low output, gradually increasing up to the age of eight years; thence to eleven years of age there was a very rapid increase. During adult life the age-groups did not differ appreciably, but after 50 years there was a distinct increase. The quantity of egg output can be correlated with the habits of the people, and in different areas with the amount of previous treatment and sanitation. In the most heavily infested of five areas studied there was a reduction of 91·9 per cent, in the egg output after treatment. It is suggested that Stoll's method should form part of the general routine in surveys made before the introduction of control measures or for the evaluation of such measures.

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* For xii–xviii. see this *Bulletin*, Vol. 20, pp. 949–51.

xxi. **On the Use of an Egg Counting Method in Soil-Culture Studies of Hookworm Larvae. (Preliminary Report.)** [STOLL.] pp. 339–342. [3 refs.]

A combination of BAERMANN'S technique for the isolation of hookworm larvae from soil and Stoll's egg-counting technique (this *Bulletin,* Vol. 20, p. 950) has been used in a study of the hookworm culturing possibilities of certain soils. Three typical soils were used, (a) black humus, common under the rich forest and banana growth and especially typical of the coffee estates, (b) sandy soil or alluvia such as is found in the pockets which result from the action of heavy tropical rains, and esteemed for its value for tobacco and other crops, (c) clay. The soil samples were first heated to kill free-living nematodes and then used in 100 gram amounts in small culture-pans mixed with 10 grams of infected faeces. The tests made showed that the cultures of faeces alone produced embryos at the rate of 15 per 10,000 ova. The ova in control cultures of the same faeces made up with charcoal according to LOOSS' method gave 16·25 per cent. of larvae. In the clay soil mixtures only 2·74 per cent. of the ova introduced were recovered as larvae. From mixtures of faeces and loam and faeces and sand about 26 per cent. of the ova reappeared as larvae, while in the mixtures of faeces and humus the high average of 65·22 per cent. was secured, and occasionally cultures were over 90 per cent. effective. The humus proved consistently good and showed less variability than any other soils. It is noted that with the Baermann apparatus only one-third or one-half of the larvae in clay may be able to get through the apparatus, but allowing for this clay gives an exceedingly low culturing efficiency and under field conditions is probably little higher. These generally negative results from faeces unmixed with soil give a hint possibly of value in the experimental testing of various types of latrines and of concentration methods for disposing of night soil.

xxii. **Further Observations on the Migrations and the Position of Infective Hookworm Larvae in Soils.** [AUGUSTINE.] pp. 416–419. [5 refs.]

Fresh stools containing abundant hookworm ova were placed in the centre of 12 wooden boxes 18″ × 18″ × 12″ filled three-quarters full of moist soil. Some with vegetation, and some without, were placed in a variety of environmental conditions. Ten days later numerous aggregations of larvae could be seen protruding from the more prominent soil clumps and from small pebbles in all the boxes with the unaided eye. The larvae congregated within the circles about 8″ in diameter where the stools had been placed, and in some of the boxes the centres appeared as if covered with hoar-frost so rich was the development of larvae. After one month the soil of the central areas 8″ in diameter and ½″ deep was examined by Baermann's isolation apparatus. In one instance 11,460 mature hookworm larvae were isolated from this zone, and only 2,020 from the remaining soil of the box. In another case the figures were 97,140 and 2,660 respectively. One month later (*i.e.*, two months after the larvae had reached maturity) the soil of the remaining boxes was examined and it was found that a great reduction in numbers had taken place but that their relative position had not altered. In one box the central area gave 520 larvae, the surrounding soil 20. In another the figures were 60 and 0. The boxes were not specially protected from rain, and it is surprising that more larvae were not recovered from outer zones. A statistical examination of the soil in the boxes was also made to determine the vertical distribution of the larvae. It was found the greatest number of larvae remain in the upper half-inch. In no instance were larvae isolated from the zone between 2½″ and 4″ from the surface. Green stalks and blades of grass from the boxes were negative. The natural habitat of the hookworm larvae is on or close to the soil surface.

xxiii. **Experiments on the Factors determining the Length of Life of Infective Hookworm Larvae.** [Augustine.] pp. 420–443. With 4 text figs. [12 refs.]

Numerous carefully plannned experiments are recorded, and from these the following conclusions are drawn :—

In moist soils in Porto Rico few infective hookworm larvae survive longer than eight weeks in deep shade and six weeks in light shade, while in direct sunlight almost all die within five days. They also die rapidly in water-covered soils. The early death of the larvae is associated with the occurrence of fungi, bacteria and protozoa, Alternate drying and moistening of soil hastens the death of the larvae.

Temperature has an important bearing on the larva's length of life. Over 99 per cent. had perished after 9 weeks at 27° C; at 35° C. all were dead within 3 weeks. At 15° C. the rate of destruction is less than at 27° C. and their length of life longer. At 0° C. the larvae perished within one week.

Dense shade affords the optimum environment for development and survival. Approximately 0·6 per cent. of the original number of infective larvae were recovered 9 weeks after the deposition of an infected stool upon the soil. Heavy rain and the drying of the soil under field conditions are shown to be important factors in reducing soil infestation.

xxiv. **Hookworm Cultures with Humus, Sand, Loam and Clay.** [Stoll.] July Suppl. pp. 1–36. With 12 diagrams. [13 refs.]

A more detailed account is given of the Porto Rico experiments summarized in the preliminary paper No. xxi.

The data obtained from 148 cultures have been further analysed and compared with results from 160 additional cultures made in the laboratory in Baltimore. The conclusions summarized from a series of tables and charts show that in Porto Rico unmodified faeces in control cultures produced negligible percentages of larvae, but even these are shown to furnish important ground itch in infective centres. The intense acidity of the faeces attributable to the predominantly vegetarian diet of the people studied is the cause of the low percentage of developments secured with unmodified faeces. Where the faeces were neutral in reaction and derived from a mixed diet unmodified cultures gave an effectiveness of 15·2 per cent. Diarrhoeic faeces, in the Porto Rico series, cultured comparably with the unformed mushy type, which were the more usual. The effectiveness of the soils in producing hookworm larvae from infected faeces is in a similar relation to the numbers of their free nematode populations and to the coarseness of the soils.

xxv. **The Use of the Egg-Counting Method in an Intensive Campaign.** [HILL.] July Suppl. pp. 37-60. With 4 graphs. [5 refs.]

In connexion with the intensive campaign in Porto Rico the Stoll method for counting hookworm eggs was used and 515 counts were made during a period of three months. It was shown that with accuracy and without additional expense the technique could be done by the regular staff of native microscopists. The counts revealed the fact that children from 5 to 9 years of age have a relatively heavy infestation, as high as that of adult women, while men are twice as heavily infected. The highest degree of infestation is amongst the field workers, the lowest in the better classes.

Routine treatment reduced the incidence of the infestation 50 per cent. and the egg output 90 per cent.

Clinical diagnosis showed a positive correlation with the degree of infestation as gauged by the egg-count.

The egg-count was almost as efficient as the centrifuge in the diagnosis of infestation in heavily infected areas, but somewhat less efficient with light cases.

xxvi. **An Epidemiologic Study of a Small Village on the North Coastal Plain of Porto Rico.** [CORT, RILEY, PAYNE (George C.) & HILL.] July Suppl. pp. 61–72. With 2 figs.

A small village of 35 houses on the north coastal plain was studied almost exactly one year after the completion of the sanitary campaign in this region, during which all the houses had been provided with latrines. Egg-counts were made on the faeces of 40 people from 9 typical houses. The degree of human infestation was determined by Stoll's method. All latrines and available places around the houses were studied for factors of soil pollution. The degree of soil infestation was determined with the Baermann apparatus. Thirty-six of the forty individuals studied were positive and gave an average output of hookworm eggs of 4,060 per gram. Only four of the 40 people reported previous treatments, and in every case this had been taken more than 5 years previously. It is evident that the presence of latrines for a period of only one year would not reduce human infestation materially even if soil pollution had been entirely eliminated. There was an average egg output of 2,350 eggs in the age-group, 5 to 9 years and in 6 adults over 50 years old the output averaged 6,550 per gram. These heavy infestations of the young and aged cannot be ignored. Evidence obtained showed that, although recently installed, all the latrines were in some degree of use and that concentrated pollution only occurred at a few places, as in the yards of 5 out of the 25 houses visited. After two weeks of gradual drying of the soil in shaded places hookworm larvae were found, but all soil infestation had died out after a period of six weeks. After the treatment-campaign had been completed new soil infestation occurred at a house where three hookworm carriers had moved in.

xxvii. **The Study of an Area in the Mountains of Porto Rico, which had been influenced for Twenty Years by Hookworm Control Measures.** [CORT, RILEY & PAYNE (George C.).] July Suppl. pp. 73–84. With 2 figs.

An area near Utuado with 25 houses, about half of which were satisfactorily sanitated, was studied to determine the present condition as a result of considerable previous hookworm control extending over a period of over 20 years. The average egg output for 111 people was 1,050 eggs per gram, which was by far the lowest for any of the areas studied in Porto Rico. Very little soil infestation was found and the conditions around most of the houses were unfavourable for hookworm development. These results emphasise the importance of the hookworm control work already carried out in Porto Rico.

xxviii. **A Study of a Heavily Infested Group of People on a Sugar and Coffee Estate in Porto Rico, before and after Treatment.** [CORT, PAYNE (George C.) & RILEY.] July Suppl. pp. 85–110. With 4 figs. and 1 map.

A mountain area with much clinical hookworm was taken as a field for study of the etiology of the disease under conditions of gross soil pollution and of intense human infestation. The area had been practically uninfluenced by any hookworm control work either by treatment or by sanitation. Observations were carried out both before and after mass treatment. The area comprised an isolated group of 27 houses on a sugar and coffee estate about 10 miles from Utuado. The average egg output was 7,740 per gram, and the estimated haemoglobin 59·5 per cent. The women were more intensely infected than the men, and the old people showed a high egg-output. The importance of severe cases in the observation of hookworm disease is shown by the fact that about 16 per cent. of the population were putting out two-thirds of the eggs. There was gross soil pollution and practically no sanitation. Almost no soil infestation was found near the houses, but the plantations of cane, bananas and coffee bordering the area were especially polluted. Heavy tropical rains proved here, as elsewhere, an important factor in temporarily reducing soil infestation. The conditions in the coffee cultivations were highly favourable, while that of bare clay soil was unfavourable to hookworm development. A series of treatments reduced the human infestation by 83·4 per cent. in a comparatively short time and there followed a marked reduction in soil infestation.

xxix. **A Study of the Relation of Coffee Cultivation to the Spread of Hookworm Disease.** [CORT, RILEY & PAYNE (George C.).] July Suppl. pp. 111–127. [15 refs.]

The relation of coffee cultivation to the spread of hookworm was studied in two areas on coffee estates in the mountains near Utuado, and the results showed that cultivation of coffee was of such importance that in the development of control measures special attention ought to be paid to coffee workers and their environment. A number of previous conclusions, such as the effect of tropical rains in eliminating soil infestation, are found valid in these situations.

xxx. **Studies on Factors involved in Migration of Hookworm Larvae in Soil.** [PAYNE (Florence King).] pp. 547–583. With 12 text figs. [18 refs.]

A series of experiments is related which were undertaken to determine the physical and biological factors bearing upon the vertical migration of larvae in the soil. The larvae live in the soil within the capillary film of moisture surrounding the soil particles. Their activity is increased by temperature up to 35° C. and by contact with other objects. The young larvae are more active than the older forms. Activity is interrupted by periods in which the larvae are refractory to available stimuli. The movements of the larvae are readily oriented by movements in the surrounding soil-water, and this stimulus plays a greater part in orientation than thermal stimuli. It explains to considerable extent the restricted nature of lateral migration on a horizontal surface and of vertical migration on a vertical surface, such as a pit-latrine wall.

Certain theoretical relationships are discussed as between the type of soil and the energy requirements of migration.

xxxi. **The Relation of the Physiological Age of Hookworm Larvae to their Ability to infect the Human Host.** [PAYNE (Florence King). pp. 584–597. With 3 text figs. [6 refs.]

Experiments were made to test the ability to infect of old larvae, which had exhausted all their nutritive granules, as compared with young and well nourished larvae. The oldest larvae retained their power to infect, but not to such a degree as that possessed by young larvae. Evidence was also obtained tending to show that a prior infestation might have some influence in rendering the establishment of a new infestation more difficult.

R. T. L.

SAWYER (W. A.), SWEET (W. C.) & SHAW (A. Eland). **Institutional Hookworm Disease in a Non-Endemic Region.**—*Jl. of Hyg.* 1923. Oct. Vol. 22. No. 1. pp. 77–88. With 1 fig. [8 refs.]

Conditions peculiarly favourable for the propagation of hookworms frequently obtain in institutions for children or defectives. At the Hospital for the Insane, Goodna, Queensland, cases of infection with *Ancylostoma duodenale* were first noted in 1889, and have been recorded at various times since. As the region is one of low rainfall and the general population is free from hookworm, and the prevailing worm in Queensland is *N. americanus*, it would appear that there has been a perpetuation of the original infection rather than a series of later importations, for the investigations reported by the authors show that 23·4 per cent. of the whole of the inmates of the hospital were infected and that the ward-rate ranged from 2 per cent. to 72·3 per cent. *Trichuris trichura* occurred in 13·3 per cent. and corresponded generally to the ward-incidence of hookworm. *Oxyuris vermicularis* ova occurred in 4·2 per cent. and *O. incognita* in about the same degree. [*O. incognita* has recently been shown to be the ova of a plant parasitic nematode *Heterodera.*] *Ascaris lumbricoides* was absent, Strongyloides and Hymenolepis each was found but once.

The high ward-incidence of helminth infection tallied with the use of earth-closets with pans. A tabular statement shows that the proportion of infected coming from infested and non-infested areas of Australia is about the same, strengthening the evidence that nearly all the cases were contracted within the institution. Moreover, the infected persons have the longest average length of stay, whereas if the infection had been chiefly contracted before admission many of the infections would have disappeared as the worms died out.

Another striking fact brought out from this inquiry is that the type of mental impairment of the patients determines the infection-rates in the various wards. The wards containing a considerable number of imbeciles, idiots and epileptics and violent insane patients had been spreading the infection, while others were relatively free.

The average infection in the Hospital was light, for the average loss of haemoglobin was only 2·2 per cent. of the normal in the five wards where the infection-rate was high. A few patients were severely affected, however, and 7 had severe anaemia, the haemoglobin varying from 40 to 55 per cent. of the normal. The blood of ten of the most heavily infected patients showed 11 per cent. to 34 per cent. eosinophilia.

Treatment with oil of chenopodium and carbon tetrachloride was given and the symptoms are carefully recorded. The most general were vomiting and drowsiness. The vomiting most frequently occurred immediately after the magnesium sulphate purge was administered. Drowsiness was noted most frequently in those patients who had received 10 cc. of carbon tetrachloride, but disappeared a few hours later. In doses of 3 cc. carbon tetrachloride was found to be relatively insufficient in removing *A. duodenale* and decidedly inferior to chenopodium in ordinary dosage. In doses of 8 to 10 cc. carbon tetrachloride had a distinct laxative effect. Few important symptoms were encountered, but these large doses are not recommended for general use.

R. T. L.

BERCOVITZ (Nathaniel). **The Hookworm Problem in China.**—*China Med. Jl.* 1923. July. Vol. 37. No. 7. pp. 576–581.

In certain districts of Hainan infection with hookworm is as high as 95 per cent. The problem of dealing with this disease in China is complicated by the facts that night-soil is universally used as fertilizer and that the natives work barefoot in the fields; also owing to the illiteracy of the majority of the people, education in sanitary matters is difficult; lastly, there is no help to be expected from official sources because the central government is unstable and the public health service unorganized. The only measure likely to be effectual is treatment of as many persons as possible and re-examination of them from time to time, with the view of gradually reducing soil pollution.

H. H. S.

LEACH (Charles N.), SCHWARTZ (Benjamin) & LEACH (Florence Dixon) with the co-operation of HAUGHWOUT (Frank G.). **Hookworm Disease: a Clinical Entity in the Philippine Islands.**—*Philippine Jl. Sci.* 1923. July. Vol. 23. No. 1. pp. 105–121. With 1 fig. & 2 plates.

Until recently the opinion was generally held, at least locally, that Filipinos suffered but slightly from hookworm infection. Investigations conducted in and about Manila have shown an incidence of from 40 to 90 per cent. in some of the rural districts. During a short visit to Cebu Island 11 cases were studied. Five showed dusky " hookworm pallor " and all a considerable degree of anaemia, the haemoglobin varying from below 10 per cent, up to 70 per cent. by the Tallquist scale, and a red-cell count between 1,380,000 and 3,334,000 per cmm. Eosinophilia was not marked, the highest was only 7 per cent. and five patients showed no eosinophiles among the first 200 leucocytes, a condition recorded by others also in severe hookworm disease.

H. H. S.

TOMB (J. W.). **Hookworm Infection in the Coal Mines of Bengal.**—*Indian Med. Gaz.* 1923. Oct. Vol. 58. No. 10. pp. 473–476.

Large numbers of the workers in the coal mines of Bengal are infected with hookworm, but the individual infection is not heavy and no gross symptoms are in evidence, so that it is regarded as of little, if any, economic importance. The haemoglobin percentage of the infected was over 65, while that of the uninfected was only in the neighbourhood of 80. All the cases were found to harbour both the necator and the ancylostoma, the former being more than twice as numerous as the latter. 4,347 persons were examined, of whom 3,616 were underground labourers and 731 surface labourers. Of the former 72·01 per cent. and of the latter 53·21 per cent. were found infected. 153 mines were found infested out of 184. The village population of the Mining Settlement was then examined. Of the " illiterate lower castes " (Bowries), of 337 examined 43·32 per cent. and of the " literate higher castes " (Hindus), of 504 examined 33·13 per cent. were infected. Lastly, the urban population of the municipalities of Asanol and Raniganj were tested. Of those living in the centre of the town and habitually using latrines 271 were examined and only 26 (9·5 per cent.) were found positive ; those living on the outskirts and depositing their excreta on the ground showed a percentage of 29·13.

H. H. S.

MHASKAR (K. S.) & KENDRICK (J. F.). **Anti-Hookworm Campaign in the Tea Estates of Madras.**—*Indian Jl. Med. Res.* 1923. July. Vol. 11. No. 1. pp. 52–64.

A campaign against hookworm was undertaken at Mudis to ascertain : (1) the incidence and intensity of infection in the tea estates ; (2) an efficient method of treatment for field work ; (3) cost of a treatment ; (4) effect of freedom from hookworm on the vitality and energy of the infected. The average incidence and intensity was found much the same as in the districts from which the coolies come. Adult men harbour on the average 68 worms, women 40, and children 30 each. The haemoglobin average of 70 per cent. is the same as that in the coolie of the plains. There is no correlation between the haemoglobin average and the number of worms harboured. One dose of thymol or betanapthol treatment without purgatives is simple and effective, being sufficient to reduce 90 per cent. of hookworm infection. Betanapthol treatment should, like thymol, be considered not altogether safe for the present. Treatments administered in the morning on a fasting stomach yield the best results. Freedom from hookworm infection diminishes the morbidity and mortality rates and increases the marketable value of labour.

R. T. L.

FÜLLEBORN (F.). **[Ueber die Uncinariasis auf den Kaffeeplantagen Guatemalas.]** [Hookworm Infection of Coffee Plantations in Guatemala.]—Vortrag, gehalten für Pflanzer am 8. July 1922 im Deutschen Verein zu Guatemala. Guatemala; Verlag Stäbler —Imprenta-Elektra. [Preis 25 Cent.] [Summarized in *Arch. f. Schiffs- u. Trop.-Hyg.* 1923. Aug. Vol. 27. No. 8. pp. 297–298.]

Hookworm infection is both widespread and severe amongst the labourers in the coffee plantations of Guatemala. Only 6·25 per cent. of the Indians had a Hb figure of 70 per cent. or over, while 24·1 per cent. had less than 20. In some cases the estate owners had undertaken the treatment of their employees with oil of chenopodium with excellent results on the whole, though occasionally toxic effects followed. Where the infection-rate was very high, all, except the smallest children and the pregnant women, were treated every six months. A recommendation was made to give, as after treatment, a 2–3 weeks' course of saccharated oxide of iron.

Proper and adequate latrine accommodation is spoken of and supervision to ensure that these are made use of, though much can be accomplished by treatment only. Porto Rico is quoted as an example.* In 1904 the average haemoglobin percentage was 43·09, but in 1914 more than three-fifths of the population had over 70 per cent. haemoglobin, and the individual working capacity had vastly improved.

H. H. S.

JAEGER (Carl). **Zur Endemie der Anchylostomiasis in den Siedlungsgebieten deutscher Einwanderer in Südamerika.** [Ankylostomiasis in German Settlements in South America.]—*Meunch. Med. Woch.* 1923. Sept. 21. Vol. 70. No. 38. p. 1200

In some districts, *e.g.* Corrientes, as many as 80 per cent. of the German immigrants examined were found infected with hookworm, and in eleven districts the average was 50 per cent. The latter proportion was also found amongst the troops in Corrientes. The drugs used in treatment were oil of chenopodium and a preparation "Isotin Bayer," an aromatic phenol product which is given to adults in doses of 2 gm. three times a day after food, for five days.

H. H. S.

MILLER (Frederick A.). **Hookworm Disease.**—*Proc. Med. Assoc. Isthmian Canal Zone.* 1920. Jan.-Dec. Vol. 13. Pts. 1 & 2. pp. 7–11.

This brief paper summarizes the question of ankylostomiasis in Panama to the end of 1919. Control measures were inaugurated in July 1914, and of 102,239 persons examined 79,175, or 77 per cent., were found infected. "First treatments" were given to 77,467 and of these 18,942 were cured. The drugs used were thymol (60 grs.) or oil of chenopodium (60 minims), both in divided doses, preceded the night before by a saline purgative. Sanitation and propaganda work were carried on at the same time in accordance with the principles of the International Health Board of the Rockefeller Foundation.

H. H. S.

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*Readers of the Report on Hookworm Infection Survey of Porto Rico dated 1919 to January 1920 (Rockefeller Foundation) will agree that Porto Rico cannot be cited as an example of the effectiveness of drug treatment *per se*. (See this *Bulletin*, Vol. 18, p. 299.)

PESSÔA (Samuel B.). **Pesquizas sobre a ancylostomose. I. "Sobre alguns pontos da endemiologia da ancylostomose em S. Paulo." II. Contribuição ao estudo do tratamento da ancylostomose.** [Researches on Ankylostomiasis. I. "Some Points in its Endemiology." II. The Treatment.]—*Ann. Paulist. Med. e Cirurg.* 1923. May-June & Oct. Year 11. Vol. 14. Nos. 5–6 & 10. pp. 40–49. With 3 charts. [5 refs.]; 115–122. [12 refs.]

Ankylostomiasis exists in severe degree in certain districts of S. Paulo· It is not uncommon for an individual to harbour between 1,000 and 2,000 hookworms. The anaemia, however, is not very great; the haemoglobin is in the region of 60 per cent. unless there is some other cause also acting, such as malaria, defective nutrition, alcoholism. Tables in the text illustrate these points and also the fact that occupation is mainly responsible for infection. Where individuals were living under similar conditions those working in the fields were found to be far more heavily infected than those who stayed at home or went to work elsewhere.

Several series of tests were undertaken to determine the most satisfactory treatment. Mixtures of carbon tetrachloride and ascaridol (the chief constituent of oil of chenopodium) in various proportions were tried. The most satisfactory combination was that containing 1·5 cc. carbon tetrachloride and 0·75 cc. ascaridol in a single dose, followed half an hour later by a purge of magnesium sulphate. 98·9 per cent. of the worms were thus evacuated. The drugs were given in separate gelatine capsules. The dose stated is that for adults. Toxic symptoms were rare; one patient gave cause for anxiety, suffering from fever, albuminuria and jaundice for a week afterwards, but he was an alcoholic subject, and the author, therefore, advises that carbon tetrachloride should not be given to such.

H. H. S.

FÜLLEBORN (Friedrich). **Ueber den heutigen Stand der Ankylostomiasisbekämpfung in den Tropen.** [The Present State of Hookworm Prophylaxis in the Tropics.]—*Arch. f. Schiffs- u. Trop.-Hyg.* 1923. Oct. Vol. 27. No. 9. pp. 320–328. [25 refs.]

This paper reviews the question of ankylostomiasis and deals particularly with the results of latrine provision. Reports from different areas are peculiarly at variance. Thus BAERMANN states that in the Dutch Indies the high rate of infection with hookworm (98 per cent.) has remained the same in spite of 10 years' intensive treatment, and the erection of latrines, while in Porto Rico treatment alone, without latrines, has brought about marked improvement.

Improvement is to be gauged, not so much by the "Hookworm Index," *i.e.* the percentage of carriers, as by the proportion of "Hookworm Sick," which depends on the degree of infection of the individual. Considered in this way the apparent contradictory reports are brought more closely into harmony. In one district, by the erection of house latrines, the authorities may aim at eradicating house infection; in another, field latrines are put up with the object of preventing infection of the labourers at their work. Neither alone will protect from reinfection and hence the high carrier rate in both. The paper contains much food for thought and does not permit readily of condensation. Those interested should make a point of consulting the original.

H. H. S.

LAMBINET (J.). **L'Ankylostomiase vainçue dans le bassin de Liège.**—*Rev. d'Hygiène.* 1923. Aug. Vol. 45. No. 8. pp. 673–685.

Judging from this contribution Liège has an excellent record for hygienic effort. In 1903 a Hookworm Dispensary was inaugurated. When the campaign was started between 6,000 and 7,000 of the 26,000 miners were found infected, and in some districts as many as 50–60 per cent. By use of ethereal extract of *Filix mas* excellent results have been obtained. In 1906 the percentage had fallen to 5, in 1912 to 2. Treatment was continued during the war, and at present the incidence of infection is only about 1 in 3,000 and the few infected are nearly always wandering labourers coming from Italy, Northern Africa, or the Congo. Every man before being employed has to submit to examination, and is not taken on until he is certified free from infection.

H. H. S.

LANE (Clayton). **An Ordinary Centrifuge with Buckets adapted for Direct Centrifugal Floatation, for Use in the Diagnosis of Ancylostome Infestation.** [Demonstration.]—*Trans. Roy. Soc. Trop. Med. & Hyg.* 1923. June 21. Vol. 17. No. 3. p. 99.

In a previous communication [see this *Bulletin*, Vol. 20, p. 947] the author maintained that direct centrifugal floatation is the simplest, most certain and most rapid method of concentrating ankylostome ova. At a demonstration before the Royal Society of Tropical Medicine a simplication of the necessary technique was shown enabling the process to be effected by means of the ordinary-sized centrifuge. The special apparatus now required is a bucket with four horns. In the bucket lies the cylindrical centrifuge tube, filled with a concentrated solution of common salt and 1 cc. of suspended stool. A special cover is dropped on to the full tube and is loosely held in position by the horns. It is essential also that (*a*) there be 1 cc. of stool suspended in at least 18 cc. of the concentrated salt solution in a tube ½ in. in internal diameter, *i.e.* one 4¾ in. long, (*b*) the axis of the centrifuge be sufficiently high to take the bucket, (*c*) the D apertures in the top cross-piece be sufficiently large to accommodate the horns and the cover. An ordinary centrifuge so equipped is said to give as satisfactory results as the large centrifuge previously described by the author.

R. T. L.

CAIUS (J. F.) & MHASKAR (K. S.). **The Correlation between the Chemical Composition of Anthelmintics and their Therapeutic Values in Connection with the Hookworm Inquiry in the Madras Presidency. XVII. Antiseptics. XVIII. Cathartics. XIX. Drugs allied to Thymol. XX. Carbon Tetrachloride. XXI. Miscellaneous Anthelmintica. XXII. Summary and Conclusions.**—*Indian Jl. Med. Res.* 1923. July. Vol. 11. No. 1. pp. 92–102; 103–109 [1 ref.] and Oct. Vol. 11. No. 2. pp. 337–346 [15 refs.]; 347–351 [9 refs.]; 353–370 [14 refs.]; 371–375.

XVII. Antiseptics.—That there is no correlation between antiseptic and anthelminthic properties is shown by the behaviour of salol, betol and salicylic acid, and in this paper the fact is confirmed by a study of potassium permanganate, kaolin, naphthalene, phenocoll, methylene blue, duotal (the carbonate of guaiacol), creosote, izal, oleum cassiae and oleum copaibae, all of which proved quite ineffective for hookworms, roundworms and whipworms.

XVIII. Cathartics.—As the majority of vermifuges are gastro-intestinal irritants, claims of anthelminthic value are occasionally made. The authors' experience is that simple purgatives have neither vermicidal nor vermifugal properties and merely hasten the removal of worms which would have passed out anyway. The present paper relates experiments made with magnesium sulphate, phenolphthaleinum, calomel, castor oil, croton oil, aloes and *Acalypha indica.*

XIX. Drugs allied to Thymol.—The high therapeutic value of thymol in hookworm infection is well established. Carvacrol is a good anthelminthic, but decidedly inferior to thymol. The vermicidal action of both thymol and carvacrol and their toxicity for the host "are conditioned by the benzenoid structure, the phenolic character, and the position of the hydroxyl group relatively to methyl." The total destruction of the benzenoid structure leads to the formation of non-anthelminthic toxic compounds,—camphor. Hydrogenation of the benzene nucleus lowers the toxicity towards the parasite and raises it towards the host,—menthol, camphor. Esterification of the phenolic hydroxy group leads to the formation of non-anthelminthic non-toxic compounds,—thymotal.

Camphor has practically no action on hookworms, roundworms and whipworms and is comparatively highly toxic to man.

Peppermint camphor (Japanese menthol) given in 18 grain dose was pleasanter to take than menthol, but its anthelminthic power was less.

Menthol in optimum dose of 18 grains expelled 24 per cent. of the hookworms in 12 test cases. Of four cases infected with Ascaris and six with Trichuris none passed worms. The efficacy of 18 grains of menthol equals that of 10 grains of thymol, of which 60 grains is considered the optimum dose.

Oil of peppermint in the optimum dose of 60 minims (which occasionally caused mild symptoms of giddiness and epigastric burning) expelled 20 per cent. of the hookworms. The worms were dead and contorted as with thymol.

Thymotal in a single dose of 40 grains expelled only 6 out of 580 hookworms, whereas the same dose of thymol administered in the same way expelled 94·5 per cent. of the worms.

XX. Carbon Tetrachloride. —Test cases of hookworm infections were divided into batches and these were treated with increasing dosages of the drug so as to follow the variations in hookworm removal and toxicity.

The drug was shaken up with an ounce of mucilage of gum acacia and dispensed in one single portion in the morning. Epsom salts were given previous to and one hour after the drug. Carbon tetrachloride is a powerful vermicide both for ancylostoma and necator worms. The worms when expelled are dead and flaccid. 5 cc. is the optimum dose for adult Tamils and removes 99·7 per cent. of the worms, giving 83·3 per cent. of cures. This dose is non-toxic to man. The drug is a definite chemical CCl_4, is easily obtainable, easily standardized and does not deteriorate with age. It is more effective and safer than any other drug now in use. Without purgatives the number of worms removed by the optimum dose is the same, but the resulting cures are fewer. In view of the reports by DOCHERTY and BURGESS (1922) that 5 cc. produces fatty degeneration of the liver and kidneys in man, no positive conclusions can be reached as to the safety of this treatment until a large number of tests have been repeated. A safe maximum dose seems to be 3 cc., since this has been given in Ceylon to a number of patients without inducing any feeling of discomfort.

XXI. Miscellaneous Anthelminthics.—Tests confirm the general opinion that santonin has no effective action on hookworms. Only 12·4 per cent. of the *A. duodenale* and 1·3 per cent. of *N. americanus* were removed in one test treatment of 5 grains in 58 cases. Chromosantonin is less toxic to the host (symptoms only appearing after 8 grains), but is not more efficient against hookworm. The same applies to Desmotroposantonin, 10 grains of which are required to induce toxic symptoms. The common rue (*Ruta graveolens*), held in high esteem by the ancient Greeks and Romans, is given in some parts of India to children as a remedy for worms. In a series of 65 cases, oil of rue with castor oil, in doses varying from 1 to 60 minims, removed only 19 hookworms out of a total of 787; but in doses of 40 minims (the limit of tolerance) followed in an hour by magnesium sulphate 60 per cent. of the hookworms present were expelled. It cannot be recommended, however, on account of its toxicity, weak action and erratic behaviour. It was found ineffective against roundworms (13 cases) and whipworms (20 cases). Embelia, the dried fruit of *E. ribes* and *E. robusta*, is reputed to be taenicidal: it proved ineffective against hookworms, roundworms, and whipworms in doses of 4 drachms, which represented the limit of tolerance.

The seeds of *Butea frondosa* are administered in India in the form of a powder of the kernels. Toxic symptoms were occasionally noticed with a dose of 40 grains. The drug has no action on hookworms. The oil from the seeds—called moodooga oil in optimum doses of 6 minims was as ineffective as the powder.

Melia azadirachta Linn. is largely used medicinally in India in the form of the oil of margosa and the juice of margosa leaves. Both are ineffective against hookworm.

Pomegranate—the dried bark of the stems and roots of *Punica granatum*—has long been used as an anthelminthic in India. A decoction was made of 2 oz. of bark kept in 2 pints of water for 24 hours and then boiled down to one pint. Four ozs. were given hourly in doses of one ounce, and the last dose was followed an hour later by Epsom salts. No toxic symptoms were noted and no hookworms were expelled, although pelletierine and isopelletierine, the alkaloids of the bark, are well established taenicides.

Quassia according to BARNES cured 70 per cent. of his cases, but following his mode of treatment the authors failed to expel any worms.

Veronia grows wild in waste places near villages throughout India. Its seeds enjoy a high repute there as a remedy for roundworms. Even 4 drachms failed to expel hookworms in 20 test cases.

Coconut is an old Indian remedy for tapeworm. The meat and milk of one nut eaten early in the morning, fasting, will expel tapeworm. No purgative is required. This treatment was found ineffective in the case of hookworms.

XXII. Summary and Conclusions.—This concluding paper lists the names of the 70 drugs which have been reported upon in this series of studies. Twenty were found to possess well marked anthelminthic properties in either maximal or submaximal doses. These 20 substances correspond to 14 chemical compounds which are *all carbon compounds*, 3 being open-chain compounds, 8 benzenoid closed-chain compounds and 3 non-benzenoid closed-chain compounds. The authors conclude:—

"Carbon tetrachloride, thymol, betanaphthol and ascaridol were found to be most effective against hookworms and equally efficacious." These four substances are carbon compounds of simple molecular composition and structure, but "differ so very much in molecular composition and structure that no general correlation can be said to exist between anthelminthic properties and chemical composition or structure. Anthelminthic action on hookworms is, therefore, specific."

R. T. L.

MHASKAR (K. S.) & KENDRICK (J. F.). **A Note on the Interval for Re-Treatment of Hookworm Infection.**—*Indian Jl. Med. Res.* 1923. July. Vol. 11. No. 1. pp. 234–236. [2 refs.]

The benefits of hookworm treatments are evident for at least one year. Hookworm infection is at its maximum in the monsoon months and annual treatment of the coolie population on the tea estates would decidedly improve the general health of the infected. The coolies acquire an average infection of 17·3 hookworms per person within the period of 4 months, 58·9 within nine months and 35·5 within 13 months. These numbers very likely represent maximum re-infections as they are based upon batches of persons most unfortunately circumstanced. The authors' experience is that an infection of less than 20 hookworms per person has but little bearing on the deterioration of health and quality of labour.

R. T. L.

LAMBERT (S. M.). **Ankylostomiasis. Mass Treatment by Carbontetrachloride.**—*Jl. Trop. Med. & Hyg.* 1923. Aug. 15. Vol. 26. No. 16. pp. 61–63.

In discussing plans for hookworm control the author notes that many carriers are left in a district, for the microscope fails to reveal 20 to 40 per cent. of these cases. Another and apparently unsuspected source of error in field work is that in tropical countries the natives cannot read, and the specimen placed in the tin left by the official staff may not be that of the person for whom the tin is intended and whose name appears on the label. Of the two schools of opinion the author belongs to that voiced by Clayton LANE which maintains that infection, however light, deserves complete treatment. This has, however, become merely an academic question with the introduction of mass treatment with carbon tetrachloride, for it is much cheaper to treat the whole population than to select the positives. In Fiji it has been found that one dose of carbon tetrachloride reduced the infection to less than 9 per cent. 27,000 doses were administered without a death and the treatment has shown itself to be popular. If, with proper organization, the whole population were treated on one day a year or twice at six monthly intervals, 90 per cent. of the egg-laying females which cause soil pollution could be exterminated, and in a few years the permanent eradication of the disease as an economic factor would follow.

R. T. L.

HOBSON (Sam). **Carbon Tetrachloride in the Treatment of Hookworm Disease with Report of Cases.**—*New Orleans Med. & Surg. Jl.* 1923. Aug. Vol. 76. No. 2. pp. 80–83. (Discussion pp. 83–84.) [13 refs.]

Carbon tetrachloride is pleasant to take and in ordinary doses (3 cc.) of a pure product induces no ill effects. It should be given on an empty stomach followed in 2 or 3 hours by magnesium sulphate. The author gives records of five cases treated in New Orleans.

R. T. L.

DOCHERTY (J. F.). **Value of Carbon Tetrachlorid as an Anthelmintic.** —*Jl. Amer. Med. Assoc.* 1923. Aug. 11. Vol. 81. No. 6. pp. 454–455.

A comparative estimate is given of the value of thymol, betanaphthol, chenopodium and carbon tetrachloride based upon the treatment of 215 prisoners with *Necator americanus* infection. The results are tabulated with the following comparisions: —

(*a*) *Percentage comparison of worms removed.*

Drug.	*1st treatment.*	*2nd treatment.*	*3rd treatment.*
Chenopodium	81·3	94·5	97·2
Thymol	84·2	94·9	97·4
Betanaphthol	93·0	97·9	99·8
Carbon tetrachloride ...	97·9	99·6	—

(*b*) *Percentage comparison of apparent cures.*

Drug.	*1st treatment*	*2nd treatment.*	*3rd treatment.*
Thymol	25·0	55·5	86·1
Chenopodium	35·9	58·9	87·2
Betanaphthol	39·6	67·9	88·7
Carbon tetrachloride ...	58·2	83·6	—

Having demonstrated that carbon tetrachloride is the most efficient anthelminthic, the author proceeds to show that the anthelminthic value of this drug is practically unaltered by differences in the number of worms harboured, whereas with chenopodium the relative efficiency arises as the worm count increases. The apparent futility of prolonged treatment is also demonstrated, since in those cases in which the total number of hookworms removed by a complete treatment was 50 or over, 98·9 per cent. were removed by one dose of carbon tetrachloride and 96·8 per cent. by two treatments of chenopodium, 99·4 per cent. by two of thymol and 97·7 per cent. by two of betanaphthol.

After a dose of 3 cc. of carbon tetrachloride followed by a saline cathartic there were no clinical evidences of renal injury, and the drug appears to be a safe and efficient anthelminthic in this dosage.

R. T. L.

COOPER (A. T.). **Some Notes on Recent Advances in the Treatment of Hookworm Disease.**—*Southern Med. Jl.* 1923. Sept. Vol. 16. No. 9. pp. 689–691. [9 refs.]

The writer treated 176 soldiers at Fort Benning with carbon tetrachloride, giving 3 cc. for a dose. No dietetic or other preparation was undertaken. At a subsequent examination of the faeces only five were found to be passing ova of hookworms and one of these five was possibly a case of re-infection.

H. H. S.

KEHRER (J. K. W.) & SOEMADIJONO. **Over Oleum chenopodii en tetrachloorkoolstof als mijnwormmiddel.** [On Chenopodium Oil and Carbon Tetrachloride as Hookworm Remedies.]—*Geneesk. Tijdschr. v. Nederl.-Indië.* 1923. Vol. 63. No. 5. pp. 709–724.

The authors recommend a mixture of 4–5 cc. carbon tetrachloride and 1·5 cc. chenopodium oil. This dose appears excessive in view of the toxicity of the drug which has lately been emphasized by others. Even higher doses, up to 10 cc., were given by the authors in order to find out the dose resulting in the highest percentage of absolute cures judging from control for absence of ova in the faeces (concentration method).

They did not, however, make any worm-counts, which considerably interferes with the significance of their experiments, moreover, concerning only small series of patients (10 for each type of cure). There were no accidents, but the patients were very drowsy after the higher doses. As far as concerns chenopodium oil, the authors present some evidence that the worms may get resistant against this treatment in chronic patients after repeated cures. [The annotator having seen fatal intoxications after 3 cc. of the drug and can state that smaller doses than this will remove 95 per cent. of the worms, seriously warns against excessive doses of carbon tetrachloride.]

W. J. Bais.

CALDWELL (Fred. C.). **The Treatment of Hookworm Disease—Chenopodium vs. Thymol.**—*Proc. Med. Assoc. Isthm. Canal Zone.* 1920. Jan.-Dec. Vol. 13. Pts. 1 & 2. pp. 110–113.

The relative claims of oil of chenopodium and thymol for use in the treatment of ankylostomiasis are dealt with and the conclusions arrived at are that the former is the more efficient, cheaper, and preferred by the patient as being less unpleasant to take. The question, however, loses much of its importance with the introduction of carbon tetrachloride.

H. H. S.

COBB (N. A.). **The Pharynx and Alimentary Canal of the Hookworm Larva**—*Necator americanus.*—*Jl. Agric. Res.* Washington. 1923. Aug. 25. Vol. 25. No. 8. pp. 359–362. With 1 plate.

Hundreds of different free-living nematodes possess a protrusile spear or onchium, and it is claimed by the author that by the time the larva of *Necator americanus* has become full grown the pharynx is modified into what may be fairly be regarded as a protrusile organ. The author gives minutely detailed figures in support of his contention. The three oesophageal glands open exactly where they could best function if an onchium were present. Moreover, the severe and lasting itching irritation induced by penetration of the skin may be explained better if referred to a secretion than if attributed to the motions of the larvae. Another set of organs named amphids, commonly seen in the free-living forms, are also present in the larva of *Necator americanus*, and correspond exactly in number, form, symmetry, position and structure.

R. T. L.

RAMSAY (G. C.). **The Dissemination of Human Helminthic Infections by Animals.**—*Indian Med. Gaz.* 1923. Sept. Vol. 58. No. 9. pp. 422–424.

In the tea-garden practice in Cachar under the supervision of the author it is very noticeable that the most unhealthy gardens are those where coolies are allowed to keep pigs. To investigate further the theory of the dissemination of hookworms by pigs, six pigs were purchased from tea-garden coolies and their intestines were examined for helminths. Of these one only harboured nematodes of an unrecognized species in the descending colon. Microscopical examination of the contents of the gut showed hookworm, whipworm and roundworm ova in all the pigs. The author's observations show that hookworm ova swallowed by the pig can pass through the gut intact and can continue their life cycle. "The reason the pig is so dangerous in spreading hookworm is that having gorged himself with human faeces from the jungle around the lines, he returns with his faecal-laden bowel to disseminate his helminthic and protozoal infections around the coolie huts." A footnote adds that eleven additional postmortems were all negative for adult hookworms, but were positive for ova.

R. T. L.

GOODEY (T.). *Necator americanus* **and the Domestic Pig.** *Jl. Helminthology.* 1923. Sept. Vol. 1. No. 4. pp. 161–164. [7 refs.]

Two young pigs, bred in England, were submitted to infection with *Necator americanus* larvae reared from the faeces of cases in the Hospital for Tropical Diseases. In one case a thin paste of faecal matter from the culture was laid on the skin on the groin and the pig held for fifty minutes until the paste had dried. Six weeks later a dose of about 200,000 larvae were administered by the mouth. Two and a half months after the first experiment the pig was killed and the alimentary canal thoroughly searched without result. A specimen of *Oesophagostoma dentatum* was recovered from the large intestine. The second pig received a similar dose of larvae by the mouth on the same day as the first pig and was killed 5 weeks and 3 days later with negative result. In this case 50 adult *O. dentatum* were recovered. The similarity of the eggs of *O. dentatum* to those of hookworms is commented upon as a possible source of fallacy in the examination of the faeces of pigs used for experimental work on human ankylostomiasis.

R. T. L.

DARLING (Samuel T.). **The Occurrence of** *Ancylostoma braziliense* **de Faria 1910 in the Philippine Islands.** —*Jl. Parasit.* 1923. June. Vol. 9. No. 4. pp. 234–235. [5 refs.]

Hitherto *A. braziliense* has not been recorded from dog or man in the Philippines. The author has examined 480 ankylostomes from a pointer pup from Manila. Of these 63 per cent. were *A. caninum* and 37 per cent. *A. braziliense.* The mouth-parts of some specimens of *A. braziliense* possessed the peculiarity that one of the large pair of teeth, sometimes both, had truncated ends, thus giving the tooth a plate-like rather than a tooth-like appearance. This feature occurs also in specimens from Brazil, Sierra Leone and Panama.

R. T. L.

FÜLLEBORN (F.) **Kommt "Küsten-Erysipel" und** *Onchocerca caecutiens* **ausser in Guatemala auch in Mexiko vor?** [Do Coast Erysipelas and *C. caecutiens* occur in Mexico as well as Gautemala?] *Arch. f. Schiffs- u. Trop.-Hyg.* 1923. Nov. Vol. 27. No. 10. pp. 386–390. [1 ref.]

The case of a boy 5 years, a native of Mexico, is described. He had from time to time from the age of 3 years exhibited swelling of the arms and face and a bluish discoloration of one cheek. A younger brother, 3½ years old, showed similar symptoms. The father, an intelligent man, told Prof. Fülleborn that in his district there were many persons (some 30 per cent. of the Indians) suffering from "coast erysipelas," an afebrile condition resembling that of this boy and associated with onchocerca. In this patient no onchocerca was found, but the blood contained 31 per cent. eosinophiles. Simulium ("coffee-flies"), which ROBLES regards as carriers of the parasite, are very prevalent in the Mexican coffee-plantations. From the history and geographical considerations the author is of opinion that *Onchocerca caecutiens* and coast erysipelas are not limited to Guatemala.

H. H. S.

i GUERRERO (Pastor). [**Juicio critico sobre el estudio de la Onchocercosis Guatemalteca.**]—*La Juventud Médica.* (Guatemala.) 1922. Sept. Year 22. Vol. 19. No. 225. pp. 460–467.

ii RETI (Adolfo). [**Bocio, Mixedema y Filaria.**]—*Ibid.* pp. 471–474.

iii MORA (Carlos Federico). [**Trastornos mentales en un caso de Onchocercosis.**]—*Ibid.* Dec. No. 228. pp. 522–524.

iv SÁENZ (Carlos Fletes). [**Dos Observaciones de Onchocercosis.**]—*Ibid.* pp. 531–532.

[All summarized in *Arch. f. Schiffs- u. Trop.-Hyg.* 1923. Nov. Vol. 27. No. 10. pp. 395–399.]

i. This paper sounds a timely warning against the *post hoc ergo propter hoc* fallacy as applied to onchocerciasis. The rapid disappearance of symptoms after removal of an onchocerca node does not prove their causative relation. Guerrero states that cases are not followed up to see whether symptoms return; that many with similar conditions do not recover after removal of the tumours; that very likely these are merely coincidental since onchocerciasis and endemic goitre prevail in the same district of Guatemala between the rivers Guacalate and Nahualate; and that, if the onchocerca toxins produced the ocular disturbances and myxoedematous conditions described as lasting for a long period, the effects would be too marked for them to disappear with such startling rapidity as has been recorded.

ii. An interesting theory is advanced to account for the prevalence of goitre, myxoedema and onchocerciasis. Very small amounts of iodine—0·1 mgm. per head per day—suffice to ward off goitre in endemic areas. Sea-salt contains definite amounts of iodine, as do also plants near the sea; water in volcanic regions is rich in it, while those in chalk and magnesium soils contain very little. These findings are applied to Guatemala. In the district between the rivers Guatalate and Nahualate, at an altitude of 4,000 feet, the soil is made up largely of coral chalk and magnesia without iodine, and this is a focus of endemic goitre; below this level, between 2–4,000 feet, is the zone of myxoedema and onchocerciasis, and the water and plants contain no iodine. This element in the body, he states, is antiparasitic and thus prevents infection by onchocerca. Professor FÜLLEBORN, in commenting on this, says that sea-fish, rich in iodine, are not worm-free; also that he knows the onchocerca region which, on the Pacific slopes, is volcanic and has an entirely volcanic subsoil. This militates directly against the theory. The author recommends treating the whole of the population in onchocerca regions with iodine in solution or tablet form every other day, and affirms that the disease would disappear just as variola from a vaccinated district.

iii. An account is given of a man who for two years had been subject to auditory and visual hallucinations, and, later, to headache and delusions of a harmless character, and who, on examination, showed contracted pupils with failure to react to light and convergence, and loss of tendon reflexes. An onchocerca node was found on the occiput and was excised. From day to day the pupils became less contracted, and after 10 days the hallucinations completely disappeared; the tendon reflexes, however, did not return. The author, albeit with reserve, thinks that the clearing up of the hallucinations resulted from the removal of the node.

iv. Two cases are referred to in this review. In the first the patient had noticed an onchocerca node on his head for some time, when increasing ocular troubles appeared—smarting, photophobia, diminished field of vision, but reading tests practically normal, 5/10. The node was removed and the subjective symptoms cleared up in 4 days and the vision was normal by the eighth day. The second patient had four such swellings on the head, but his only complaint was a little smarting of the eyes. There was some degree of hemeralopia without photophobia. Vision was normal. The nodes were excised and the slight symptoms disappeared.

H. H. S.

BIHLMEYER (G.). **Distomum hepaticum beim Kind.**—*Monatsschr. f. Kinderheilk.* 1922. Vol. 22. pp. 587–589.

COTTIN & SALOZ. **A propos de la valeur des réactions biologiques dans le diagnostic des kystes hydatiques du foie.**—*Arch. des Maladies de l'Appareil Digest. et de la Nutrition.* 1923. Vol. 13. No. 1. pp. 44–59. [34 refs.]

FABRE (Henri). **Ascaridiose à forme typhoïde.**—*Bull. Soc. Path. Exot.* 1923. Oct. 10. Vol. 16. No. 8. pp. 598–599.

HARRIS (H. Elwin). **Intestinal Spasm due to** *Ascaris lumbricoides.* **[Memoranda.]** —*Brit. Med. Jl.* 1923. Dec. 15. p. 1151.

NOVIS. **Partial Obstruction of the Pancreatic Duct by Round Worms.**—*Brit. Jl. Surgery.* 1923. Jan. Vol. 10. No. 39. p. 421.

PORTLEY (Kathleen). **Ascaris Appendicitis.**—*Irish Jl. Med. Sci.* Dublin. 1923. June. 5th Ser. No. 16. pp. 169–170.

RIGBY (Hugh M.). **Acute Haemorrhagic Pancreatitis: Round Worm in Pancreatic Duct.**—*Brit. Jl. Surgery.* 1923. Jan. Vol. 10. No. 39. pp. 419–420. With 1 fig.

TSUJIMURA. **Ueber die Ascaridiasis der Gallenwege.**—*Deut. Ztschr. f. Chir.* Leipzig. 1922. May. Vol. 171. No. 3–6. pp. 398–412. [23 refs.]

TUBERCULOSIS (CORRESPONDENCE).

Johannesburg,
11th January, 1924.

Dear Sir,

I have just received No. 12 of Volume 20 of *Tropical Diseases Bulletin*, in which appear two reviews of the *Proceedings of the Transvaal Mine Medical Officers' Association*, dealing with tuberculosis among natives.

As I am Chairman of the Sub-Committee which is dealing with the matter, and also head of the Sanitation Department of the largest Group of Mines in the Transvaal, permit me to make a few observations on your review. I would preface my remarks by stating that I appreciate very fully the justice of the criticisms you have made in your review, and that to anyone who has no detailed knowledge of the conditions in South Africa some of our recommendations would certainly seem quite inexplicable. I will therefore take the liberty of burdening you with a short description of the conditions under which we recruit our native labour, and certain of the laws under which we must fit our procedure.

Our native labour, to the number of about 200,000 per annum, is recruited in British South Africa and in a portion of Portuguese East Africa, from the Cape to parallel 22 south. About a quarter of this number come to the mining area voluntarily seeking labour, the remainder are collected by traders and recruiting agents. In the case of natives recruited in the Union of South Africa a preliminary medical examination is made at the town or village nearest to the natives' residence. This examination is usually conducted by a local medical practitioner who has no knowledge of mining conditions, and who deals with the examination of natives as a merely minor incident of his day's work. The examination is perforce only a cursory one, and the guide framed in these recommendations is primarily intended for the guidance of these practitioners, and could not be made more extensive without encountering so much opposition that the ends in view would be defeated.

On arrival at Johannesburg all these natives are deverminised, because of the prevalence of typhus in most of the recruiting areas, and are then examined by a full-time medical officer thoroughly conversant with mine requirements. After arrival on the mine they are again examined by the Mine Medical Officer, the latter examination being intended to be a check on the previous two, and further to eliminate natives whose physique is not suitable to the special conditions prevailing on the particular mine.

The natives recruited in Portuguese East Africa undergo a merely perfunctory medical inspection by a Portuguese medical officer, and the only thorough medical examination takes place on the individual mines. It is quite impracticable to arrange for a thorough medical examination in Portuguese East Africa because of the lack of suitable Portuguese medical personnel for this purpose, geographical difficulties, and the fact that we have been unable to arrange with the Portuguese Government for our own medical men to carry out examinations in Portuguese territory.

Under the law all miners, whether European or native, must undergo a periodical medical examination, which, in the case of the natives, is conducted monthly by the Mine Medical Officers. If the Mine Medical Officer suspects a native of having tuberculosis, the native is sent for diagnosis by the Government Medical Officers attached to the Miners' Phthisis Bureau. If these Officers certify that the native is suffering from tuberculosis, he must be discharged immediately from the service of the mine and repatriated to his home, unless the Native Affairs Department can be satisfied that the travel incidental to repatriation would probably result in fatality.

Practically all the tuberculous natives insist on returning to their kraals.

We have made very extensive enquiries into the possibility of establishing Sanatoria for natives either on the Witwatersrand or near their homes, and authoritative advice is unanimous that such institutions would serve no useful purpose, as the bulk of the natives would refuse to enter these; hence the reason for our recommendation against the establishment of Sanatoria, and the suggestion for utilising existing hospitals, which can take care of the very few cases who have no homes to return to, or who, for any other reasons, are willing to enter an institution for treatment.

To take up some of the specific criticisms you make.—With regard to tachycardia, we quite realise that tachycardia is often associated with early tuberculosis. It is, however, a fact that a very large number of natives have tachycardia unassociated with any disease.

Were we to reject all natives with tachycardia, we would be depriving the mines of a very large portion of their force, and many fit natives of an opportunity of earning a living.

It has not been our experience that functional tachycardia, as we call it, is premonitory of tuberculosis. We therefore take the risk of having such natives sent up to the mines, and leave it to the more experienced Mine Medical Officer, and the greater opportunity he has for correct diagnosis, to decide whether the native should be accepted for work.

We have made no reference to sub-clavicular glands because in our experience these are so exceedingly uncommon among the local natives as to be negligible for the purpose of a preliminary weeding out of undesirable natives.

We quite realise that were it possible for us to keep every recruit under observation for several days we could eliminate a very much larger number of natives with a predisposition to tuberculosis, but this would mean housing arrangements of so extensive a nature and so costly that such a course is beyond the bounds of practicability. We do retain for observation all suspicious cases.

With regard to our definition for the classification of tuberculosis, I freely acknowledge that you are quite correct in your remarks. This classification was adopted practically verbatim from the recommendations of the National Tuberculosis Association of America. We understand the word "constitutional" in these recommendations as including fever. This is quite clear to all our Mine Medical Officers.

Finally, as some proof that our methods of combating tuberculosis on the mines are not altogether unsatisfactory, I may point to the fact that in our Group of Mines, with an average of about 80,000 natives, the mortality from tuberculosis, which in 1911 was 3·7 per 1,000, has gradually declined since then, and in 1922 was 0·78 per 1,000. When I assumed my present appointment in 1914 the mortality was 2·6 per 1,000. Furthermore, in 1916 Drs. WATKINS-PITCHFORD, STEWART and myself undertook an investigation covering some 400 natives, selected at random from two of our mines, with a view of enquiring into the prevalence of undetected tuberculosis among the natives on the mines. We found only one case with open tuberculosis among these 400, and this man was known to be a sufferer from tuberculosis, and was retained on the mine merely because he was an old employee and had no other place to go to. He was employed as a watchman.

I trust you will pardon this rather discursive letter, but I consider it will be of interest to you to know a little more of the facts than appeared in our *Proceedings*.

Yours faithfully,

A. J. Orenstein.

To Colonel S. Lyle Cummins, C.B., C.M.G.

Cardiff, *8th February,* 1924.

Dear Sir,

I have just received your letter, and I beg that you will excuse any point in my notice of the *Proceedings of the Transvaal Mine Medical Officers' Association,* which depended on ignorance of local conditions.

I have never been in South Africa and my knowledge of tuberculosis amongst African natives has been gained entirely amongst the tribes of the Anglo-Egyptian Sudan. My experience in North Africa enables me to appreciate fully the difficulties which you have to face and, at the same time, makes me deeply interested in your problems.

I note that in your letter you frankly admit the justice of some of the points made in my review; and your remarks about the others are so interesting and so important that I have ventured to send your letter to the Director of the *Tropical Diseases Bureau* with a request that he should publish it in the *Bulletin,* so that you may speak for yourself.

It is very interesting that you have found no supra-clavicular glands amongst the South African natives.* Their importance amongst the Senegalese is reiterated by Dr. BORREL in a recent publication ("Hygiène et Pathologie des Contingents Coloniaux en France." Congrès de la Santé Publique et de la Prévoyance Sociale, Comptes Rendus des Séances, 1922, September 11 17) which I have just been reviewing for the *Bulletin.* I do not recall having found this sign in infected patients from the Sudanese battalions in North Africa, but this may be because I did not then know about it or especially look for the enlarged glands.

It had not occurred to me that a short period of observation was impossible on account of the cost of housing arrangements. I should have thought that shelters of a very primitive kind, and costing little more than a few hours' work by the natives themselves, would have served this purpose in a country where plenty of space might be expected to be available; but in this I am open to correction.

I still feel that there are grave risks in treating progressive cases of pulmonary tuberculosis in the wards of general hospitals, but I am sure that these risks could be greatly diminished or entirely removed by housing such patients in cheaply constructed open-air shelters in the grounds of general hospitals, where they would be separated from other patients and still be under conditions ideal for their disease. Here, again, there may be difficulties of which I am not aware; or this may be done already.

The figures that you so kindly give in support of the efficiency of your methods of combating tuberculosis are to my mind most striking and encouraging; and it is a pleasure to close this letter with my warmest congratulations on the success that has attended your labours.

The *Proceedings of the Transvaal Mine Medical Officers' Association* make to me most interesting reading and constitute a most valuable record about tuberculosis in native races. That is one of the reasons why I have devoted considerable space to Summaries of them in the tuberculosis portion of the *Tropical Diseases Bulletin.*

Yours faithfully,

S. L. Cummins.

Dr. A. J. Orenstein, Johannesburg.

*P.S., 24th Feb.—I find, to my great regret, that owing to an error of my own, either in my manuscript or in proof-reading or in both, the expression "sub-clavicular glands" was used in the summaries to which Dr. Orenstein's letter refers. The "glands of BORREL" are described by him as "sus-claviculaire" or supra-clavicular. I have a case of pulmonary tuberculosis in a Greek child at present under treatment in which such a gland is both visible and palpable in the hollow just above the clavicle. A deliberate search for these supra-clavicular glands in native mining personnel in South Africa would be of great interest.

S. L. C.

MEDICAL ZOOLOGY (CORRESPONDENCE).

FANTHAM (H. B.). **Some Parasitic Protozoa found in South Africa. V.** (Abstract).—*South African Jl. Sci.* 1922. Dec. Vol. 19. pp. 332–339.

SHORTT (H. E.). **The Pathogenicity of Insect Flagellates to Vertebrates, with Special Reference to** *Herpetomonas ctenocephali*, **Fantham.**—*Indian Jl. Med. Res.* 1923. Apr. Vol. 10. No. 4. pp. 908–933. With 1 plate.

Regarding the remarks of the reviewer, A. A., on page 780, vol. 20, No. 10 of this *Bulletin* (October 1923), on an experiment of mine with *Herpetomonas muscae domesticae* and a young white rat, I would point out that the account published by me was an Abstract, and that the paper in which the account occurred is clearly headed Abstract. Needless to state, the young rat, bred from parents of a known stock, was kept in an isolated insect-proof cage. In these days of financial stress, reiterations of research methods, which have become matters of ordinary scientific practice, are often not accepted for publication in scientific journals, because of the cost of printing and publishing. Remarks on "crudity," "bad company" and "reservation of judgment" are, in this connexion, inaccurate and unnecessary.

Regarding certain statements by the same reviewer on page 785 of the same *Bulletin*, I am sorry to have to differ from his remark that I found "uninucleate forms" to be "frequent." As a matter of fact I found few such forms and those only in a very few animals, and leishmaniform types of non-flagellate parasites only were considered in making deductions regarding non-flagellate forms. Indeed, in a paper by Dr. A. PORTER and myself, published in January, 1915, in *Proc. Camb. Philosoph. Soc.*, vol. xviii, p. 46, it is stated that we did not observe many small rounded uninucleate elements, and that such elements need further consideration and do not occur in natural leishmaniases. In a paper published in June, 1915, in the same journal, on p. 142 "seemingly uninucleate elements" are mentioned and it is stated that "on careful analyses" they were "ascertained to be really binucleate." Again, on p. 143 "some uninucleate forms were present" but were "rare." In another paper by Dr. PORTER and myself, dealing with experiments on birds (*Annals Trop. Med. & Parasitol.* vol. ix, Dec. 1915) "uninucleate forms" are mentioned on p. 546, but are stated to be "few." Accompanying these memoirs we published two plates, containing 60 figures, but not a single uninucleate form is drawn, simply because we saw them so rarely, and they were not necessarily of direct significance. Again, the statement is made that "many vertebrates are infested with herpetomonads of their own." Precisely, and I was among the first to show that herpetomonads occurred naturally in the blood of certain vertebrates, and so took extra precautions to ensure that my experimental animals were clean before they were used. Herpetomonads also occur naturally in the alimentary tracts of certain vertebrates. That herpetomonads can be experimentally introduced into laboratory-bred vertebrates, repeatedly examined for parasites before use and proved to be clean, is really only reproducing a natural phenomenon and need occasion neither surprise nor controversy. It is to be regretted that apparently certain workers have been unable successfully to perform such experiments.

H. B. Fantham.

A reviewer must deal with facts and inferences from the facts as they stand published in the text reviewed. In summarizing both of the papers referred to above (this *Bulletin*, Vol. 20, FANTHAM p. 780, and SHORTT p. 784) that principle was observed strictly.

A. Alcock.

REVIEWS AND NOTICES.

HEGNER (Robert W.) & TALIAFERRO (William H.). **Human Protozoology.**—pp. xix + 597. With 197 figs. and 2 coloured plates. 1924. New York: The Macmillan Company. [Price not stated.]

This book is meant primarily for students in the School of Hygiene of the Johns Hopkins University, but undoubtedly it should find wider use and favour. It gives a concise and coherent general account of the biology› the Protozoa, group by group, as exemplified by representative species and deals in well digested detail, and in their taxonomic setting, with the species found in the intestine and faex and blood and tissues of man In this detail are included, besides accurate descriptive matter, modes and media of transmission and dissemination, and historical precedence and progress. There is a useful chapter on laboratory methods of diagnosing and dealing with intestinal Protozoa, and various methods of cultivating these organisms are described in appropriate places in the text. Pathogeny is not obtrusive, controversial matters are treated with judgment and moderation, and, for motives of humanity with which most of us will be in accord, the peevish distractions of "nomenclature" are deliberately ignored. Some of the digressions from the main line, particularly that on malaria surveys and malaria control, are in every way excellent; others, like genetics and immunology, may reasonably be regarded as out of place in a book intended for beginners in Protozoology. Naturally many Protozoon parasites of lower animals are made good use of in expounding the main theme of the book, and proper stress is laid on the value of this enormous field of study; it is a pity, therefore, to find Proteosoma honoured only by an allusion, and the discovery of its exogenous cycle and exact mode of transmission (which is one of the significant events of history) left unnoticed, and also to meet with nothing but ARAGAO's incomplete account of the exogenous cycle of another insfructive Haemosporidian, Haemoproteus, although Mrs. ADIE's interesting completion of the account was published nine years ago.

The book is well documented and well indexed, and it can honestly be recommended to English students whether they be imprisoned in an academic course or have free souls.

A. Alcock.

NICHOLLS (Lucius). **Malaria in Ceylon: A Pamphlet for Teachers.**—10 pp. With 9 figs., 1 chart and 1 folding map. Colombo: Govt. Printer. [Price not stated.]

This admirable pamphlet upon malaria, for the use of school teachers in Ceylon, promises a goodly fulfilment of its purpose; for it not only imparts an account of the causation and methods of prevention of malarial fevers such as a non-professional person can readily grasp, but it also indicates—by a large-scale map showing the topographical incidence of malaria throughout the island—those districts that stand most in need of the instruction provided.

A. Alcock.

SÉGUY (E.) **Histoire Naturelle des Moustiques de France. Étude systématique et Biologique des Moustiques de l'Europe Centrale et Septentrionale et de leurs Parasites.**—225 pp. With 201 figs. 1923. Paris; Paul Lechevalier, 12, Rue de Tournon. [Price 15 francs.]

This admirable little book contains besides a comprehensive systematic study of the mosquitoes of central and southern Europe, an excellent account of the phylogeny, morphology, biology and parasitology of the Culicidae.

A. Alcock.

Ellis (Henry A.). **Reaction in Relation to Disease.**—27 pp. With 3 figs. 1924. London: H. K. Lewis & Co. Ltd. [Price 1s. net.]

This pamphlet is the reprint of a paper read last year before the Tuberculosis Society of Great Britain, and begins " Life is an acid phenomenon in an alkaline or neutral medium." This is later expanded to mean that living cells form acids, and the maintenance of the reaction most suitable for life is necessary for the continuance of life. In other words, the regulation of the acid-base equilibrium as it is usually termed is a most important part of metabolism, and its upset is followed by disease. The author regards the determination of the reaction of the blood, which is only a vehicular agent, as less important than the examination of the actual cells. This, however, is not what he attempts, but he is content with examining what he calls the " overflow " and more especially the overflow via the urine. The result is that he postulates *acid* and *alkaline* people, that is those with acidic and basic tendencies respectively. They differ in various ways, among which the heart was especially examined; he figures X-ray pictures of the normal, " acid " and " alkaline " heart. Tuberculous people are of the alkaline type, and the practical outcome of all this theorising is the following :—

> " We find that the treatment of the tuberculous is essentially *acid*, meats and fats, and where there is a dislike of these forms of nourishment we give Virol, malt and oil mixtures, and acid tonics."

High altitudes and the open air are also beneficial since they tend to " acidosis."

The paper closes with some urinary analyses, though the table headed " concealed acid " is puzzling.

Such I take to be the gist of the paper; it is by no means easy to be sure what the author means, for he has not got the gift of lucid writing. The ordinary medical man will no doubt be puzzled by such technical expressions as hydrogen-ion concentration and P_H which the author does not trouble to translate into plain English. Such readers may be thankful when they see in one of the author's concluding sentences that his deductions are only tentative.

W. D. Halliburton.

TROPICAL DISEASES BUREAU.

TROPICAL DISEASES BULLETIN.

Vol. 21.] 1924 [No. 4.

KALA AZAR.

YOUNG (T. M'Combie). **Some Facts in regard to the Progress of Kala Azar Work in the Province in General and in Sibsagar in Particular.** – *Proc. Assam Branch. Brit. Med. Assoc. Ann. Meeting. Haflong.* 1923. Jan. 7. pp. 10–19.

This paper gives an inspiring account of the efforts which are being made to remedy the kala azar situation in Assam. From reports of the touring staff during 1919-1920 it was evident that the disease was recrudescing, and had the weapons of defence been those of 20 years ago the result would have been exceedingly grave. The introduction of tartar emetic treatment altered the case entirely, and not only made it possible to cure about 95 per cent. of treated cases, but afforded a means of checking the spread of the disease by eliminating the reservoirs of infection. Kala azar hospitals have multiplied throughout the province, out-door dispensaries have been established, systems of inspection and registration of the population have been undertaken, and early notification of the appearance of kala azar in any family is being enforced. Though at times there has been inevitable difficulty in the enforcement of the rules, the popularity of the treatment is an undoubted fact as evidenced by the increasing number of cases which come forward. In 1921, 1,600 cases were treated, while during eleven months of 1922 the number reached 16,778. For 1923 the figure is even higher, and will probably reach nearly 20,000.

The method of dealing with infected localities is illustrated by two examples described in detail. As a result of the experience gained, it appears that if early notification and treatment of the first case during its first year in any village is carried out, there seems to be a reasonable chance that no further cases will occur, but when the number of cases discovered in one year is large, others will crop up owing to the disease having obtained a firm footing. When any outbreak is restrained by early treatment no explosive infections occur. Early compulsory treatment efficiently applied has a distinct preventive action, and renders removal to fresh sites and segregation of the infected community unnecessary, but if the infection has been firmly rooted by delay in its recognition there is reason to suppose that removal of the population and treatment of the cases will extinguish the outbreak.

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The most careful vigilance has to be maintained, for, owing to our ignorance of the method of infection, it is impossible to predict an outbreak. The regulations which have been issued as the result of long experience are given in the report, and the author is able to state that in Sibsagar, which was threatened with a decimation such as Nowgong underwent in 1891-1901, the disease is now under control.

C. M. Wenyon.

MACKIE (F. P.) with DAS GUPTA (B. M.) & SWAMINATH (C. S.). **Progress Report on Kala-Azar. (Work carried out in Shillong between June and November, 1921.)**—*Indian Jl. Med. Res.* 1923. Oct. Vol. 11. No. 2. pp. 591–599. With 1 plate. [1 ref.]

The experiments recorded in this paper afford a further demonstration of the difficulty of infecting animals with leishmania. One monkey, two rabbits and two guineapigs were inoculated intraperitoneally with emulsion of spleen juice from a fatal case of kala azar. The monkey and both guineapigs developed a transient infection, while one rabbit was found to have a slight infection when it died six weeks after inoculation. Two rabbits were inoculated intra-ocularly, the one with cultural forms of leishmania, the other with spleen juice from a human case of kala azar. The former was entirely negative, while the latter yielded a culture from the eye on the nineteenth day of the experiment.

It was shown that the leishmania ingested by bed-bugs are in a condition infective to white mice for at least 17 days.

An attempt to infect a monkey with the Crithidia of *Conorhinus rubrofasciatus* gave a negative result. The examination of 39 itch mites from a case of kala azar did not reveal any ingested blood nor leishmania.

A crithidial infection of the sandfly (*P. minutus*) is described. It is evident these flies are liable to infection with both a crithidia and a leptomonas. An examination of geckos (*Hemidactylus*) revealed a trypanosome infection on direct blood examination and a leptomonas infection in 3 out of 28 by culture of the heart blood. The flagellates are named *Trypanosoma hemidactyli* and *Herpetomonas hemidactyli* respectively.

C. M. W.

INDIAN MEDICAL RECORD. 1923. August & September. Vol. 43. Nos. 8 & 9. **Kala-Azar Numbers i & ii.**

It has recently become evident that kala azar is wide-spread throughout Bengal, and, with malaria, is exercising a deleterious influence on the economic life of the country. The importance of this disease is recognized by the fact that a conference of the medical profession of Bengal was held under the auspices of the Central Co-operative Anti-Malaria Society, Ltd., in Calcutta, when a series of addresses were delivered dealing with the new situation which has arisen since the prevalence of kala azar in Bengal has been established.

These addresses are published in two special kala azar numbers. The various speakers urge the necessity of immediate action and base their recommendations on the methods which experience has shown to be increasingly efficacious in dealing with the kala azar situation in Assam. It appears that in Bengal the disease occurs sporadically throughout the country, and that intense village infections such as occur in Assam are not a feature of its distribution. The speakers deal with different aspects of the question—incidence and distribution of the disease, methods of diagnosis and treatment, control of the population with a view to early diagnosis, regulations and procedure to be adopted with a view to its eradication. Apart from the main fact of the prevalence of kala azar throughout Bengal the papers do not contribute any new information, though details of the incidence in certain selected areas are given. They nevertheless serve to call attention to the urgency of the matter, and will undoubtedly act as a stimulus to those who have the power of taking action. They will arouse the interest and enthusiasm of the local practitioners, who have it in their power to bring the antimony treatment within the reach of thousands of sufferers. It was felt that the Anti-Malaria Society, with its established organization, would be the most suitable authoritative body to control the campaign against both malaria and kala azar. There is an opportunity for great philanthropic work on the part of everyone who has an interest in the welfare and development of this fever-stricken country.

C. M. W.

CHATTERJEE (G. C.). **Kala-Azar in Bengal.** [Correspondence.]—*Indian Med. Gaz.* 1923. Nov. Vol. 58. No. 11. pp. 553–554.

At the Conference of the Medical Profession of Bengal which was held under the auspices of the Central Co-operative Anti-Malarial Society, Ltd., a series of resolutions relative to the wide-spread nature of kala azar in Bengal were adopted. It was decided, amongst other things, that the above-mentioned Society was in the best position to deal with the disease, which was so intimately intermixed with malaria, and that in order to facilitate the carrying out of preventive measures it was desirable that the sanitary sub-committees of District Boards be composed mainly of medical men who should be given the right of distributing the sanitary grant of the District Board in consultation with the Society.

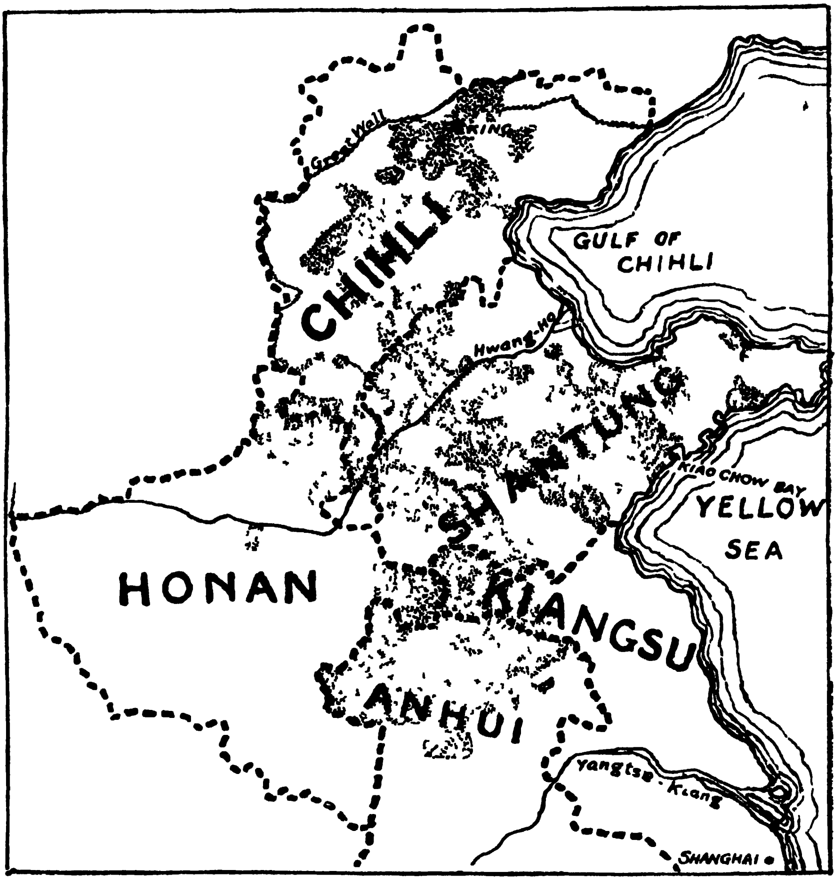
C. M. W.

YOUNG (Charles W.). **Kala-Azar in China.**—*China Med. Jl.* 1923. Oct. Vol. 37. No. 10. pp. 797–822. With 7 maps, 1 fig. & 1 chart. [42 refs.]

This is a most interesting article which summarizes our knowledge of kala azar in N. China. The first case was that of a German soldier who contracted the disease during the relief of the Pekin legation in 1900. He died later in Germany, and the peculiar intracellular bodies which occurred in preparations of the spleen, liver and bone marrow were demonstrated at the Leipzig Medical Society in February 1903. No one was able to give a satisfactory explanation of their nature, and it was only after LEISHMAN's announcement made later in the same year that the similar bodies found by him in a case of Indian kala azar were actually parasites that MARCHAND and LEDINGHAM in 1904 realized what the bodies were which they had seen in Germany.

From that date till 1911 seven other cases were reported from N. China. COCHRAN (this *Bulletin*, Vol. 3, p. 130, map) then gave the first thorough account of the disease as it exists in China and Korea. The observations recorded in this paper, which is illustrated by a series of maps and charts, shows that it is more wide-spread than was hitherto supposed. COCHRAN reported twelve centres which have now to be extended to twenty-five, while in the centres previously noted the infection is much more intense than the reported cases led one to suspect. A careful examination was made of the village of Sha Liu Ts'un in the southern part of Tinghsien, from which nine cases of kala azar had been seen at the Taylor Memorial and Hodge Memorial Hospitals in Paotingfu. In all, 97 persons, belonging to 40 families, were examined, and it was found that one family in every twelve had had a case in the last four years. This means that about 1⅔ per cent. of the population had had kala azar in that time. In travelling to the above-mentioned village a less careful examination was made in eight other villages, and in five of these definite evidence of the

MAP OF DISTRIBUTION OF KALA AZAR IN NORTH CHINA



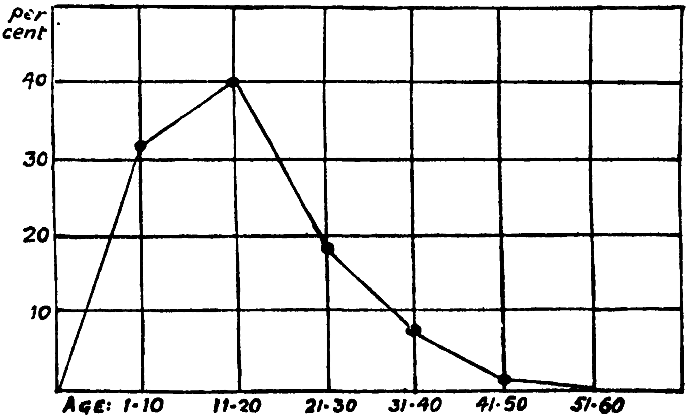
Besides the endemic areas (shaded black) shown on map there are areas in Hupeh and lower Kiangsu of which the limits have not been determined. [After Dr Charles W YOUNG's map in the *China Medical Journal*.]

existence of kala azar was obtained. In these examinations reliance was placed on the clinical picture, especially marked enlargement of the spleen, and a positive globulin test. The village which received particular attention lies on a sandy plain. Its inhabitants are prosperous farmers, and many of the houses are built of brick. With the absence of poverty there was little infestation with lice. The infected houses were fairly evenly distributed in the village, and the 20 cases found there belonged to 20 different families. Though the meaning of a positive globulin test in animals is not yet understood, a number of animals were tested by this means. Three hens and a cow gave a positive result, but 3 dogs and 2 cats were negative.

As regards kala azar in other areas WYLIE of Paotingfu (this *Bulletin*, Vol. 17, p. 356) has seen 84 cases between 1918 and 1922. The area from which they came lies to the south of the hospital centre. A spot map of the Pekin Union Medical College Hospital shows that in the Chihli Province 100 cases were seen between 1916 and 1922, and that these came from areas in railway communication with the centre. Their distribution along these routes is no indication of the actual intensity in the Province. In a clinic at Pien T'ang, 100 li east of Hsüchowfu, MACFADYEAN saw 25 cases which he diagnosed as kala azar among 125 patients. At Ting Chwang, 18 li south of Hsüchowfu, it is reported by the inhabitants that every second child in the village has the disease ; while at another village, Hwang Mo Kang, 3 li south of Hsüchowfu, where there are about 100 families, there are 20 cases.

From the data available it is safe to say that kala azar is endemic over most of Chihli, Shantung, north-western Kiangsu, northern Anhui and northern Honan. Furthermore, there are areas not indicated on the map, in Hupeh and lower Kiangsu, but the limits of these have not been determined.

Other matters relating to the disease as it occurs in China receive attention. A table and chart illustrating the age incidence of 762 cases shows that, as is commonly the case, kala azar attacks chiefly children and young adults. The value of the globulin test is discussed and the remark is made that while there are no grounds beyond experience on which to base the statement that the test is specific for kala azar,



Age incidence of kala azar in China.
[Reproduced from the *China Medical Journal*.]

such has been the estimate of most who have used it. In a foot-note it is pointed out that Dr. MELENEY of the Pekin Union Medical College has shown that it is constant in well developed cases of schistosomiasis and that it tends to disappear under antimony treatment. The formol-gel test was also found to be positive. As regards kala azar, the globulin test when positive is only considered as yielding presumptive evidence of the disease, which must be finally diagnosed by the discovery of leishmania. By adopting the technique devised by the author and VAN SANT (this *Bulletin,* Vol. 19, p. 548) the parasites can be recovered from the peripheral blood of a large percentage of cases. A table shows that in 27 slides made from the centrifuged deposit of nine specimens of blood of untreated cases all the specimens showed parasites in one or more slides. The films are made from the lowest layer of the leucocyte deposits as described in the method for blood culture.

Clinically there is nothing peculiar in the cases. It is noted that in the kala azar areas there occur many cases of splenomegaly which are not due to this disease and cannot be attributed to malaria, which is not endemic there. The nature of this condition is not known.

C. M. W.

ARCHIVOS DEL INSTITUTO NACIONAL DE HIGIENE DE ALFONSO XIII. 1923. Aug. Vol. 2. No. 2. pp. 67–84. With 9 text figs. [3 refs.].

Nuevos Casos de kala-azar infantil en el centro de España (Cáceres, Madrid, Toledo). Un caso de muerte por el Stibenyl.

The paper gives a further record of kala azar in Spain. Thirteen cases are recorded in the body of this paper and five more in an additional note. There are three main points of interest: (1) All the cases occurred in Spain itself and in districts where the existence of the disease had not been suspected; (2) Stibenyl given intravenously in doses of 0·1gm. in 2cc. of distilled water yielded as a rule excellent results; (3) The use of this drug is not always devoid of danger; one patient died, clearly as the result of it. The details of this case are as follows: A well-developed female child, 19 months of age, began to show symptoms early in 1923, and in April leishmania were seen in a smear made from a spleen puncture. On April 28th, 0·05gm. Stibenyl was given intravenously, on April 30th and May 2nd 0·1gm. intramuscularly, on May 4th 0·15gm intravenously, and on May 6th and 8th 0·15gm. intramuscularly. The first five injections produced no ill effects, the sixth was followed by intense local reaction and a rise of temperature to 40° C. These symptoms soon disappeared.

For the ensuing 17 days no treatment was given owing to lack of the drug. A fresh supply having been obtained 0·1gm was injected intravenously on May 27th and immediately there followed vomiting, cyanosis, involuntary passage of faeces, and syncope, death being almost instantaneous. The cause assigned is anaphylaxis, and the author records that in a former patient where an interval of 10 days had been allowed to elapse between injections 0·1gm. intravenously produced intense vomiting and a papulo-erythematous eruption which lasted for several hours. Experiments carried out on a dog, however, with an interval of 12 days between injections, caused no anaphylactic symptoms.

H. Harold Scott.

BASSETT-SMITH (Percy). **Naval Medical History of the War. Section of Tropical and Sub-Tropical Medicine. Part II.—(ii) Kala Azar.**—*Jl. Roy. Nav. Med. Serv.* 1923. *July.* Vol. 9. No. 3. pp. 201–203.

A short account of kala azar based on two cases which occurred in the navy. The first has been already reported by the author (this *Bulletin,* Vol. 5, p. 266). In the present paper it is stated that the treatment with atoxyl and autogenous vaccines of killed cultures of leishmania had brought about a complete cure, for the patient was at work in 1921, seven years after his course of treatment was completed. The second case, also from Malta, was treated successfully at Greenwich with injections of tartar emetic. He remained well for a year but was then lost sight of.

C. M. W.

FONZO (Ferdinando). **Kala-azar e malaria in raporto alla stagione e al clima.** [Kala Azar and Malaria in regard to Season and Climate].—*Pediatria.* 1923. Dec. 1. Vol. 31. No. 23. pp. 1262–1269. With 3 charts. [29 refs.]

This paper is mainly a study of kala azar from an epidemiological aspect. This disease and malaria occur in the same district, but the author does not agree that they are antagonistic, as some have thought, though he has not met with a case in which the two were co-existent. The period of prevalence of malaria is the summer, of kala azar the winter and spring. Further, he does not support the theory that the transmitter of kala azar is the *Pulex serraticeps* [*Ctenocephalus canis*] because, it is stated, this flea does not bite in the winter months.

H. Harold Scott.

YOUNG (Charles W.) & VAN SANT (Helen M.). *Leishmania donovani* **in the Peripheral Blood.**—*Jl. Experimental Med.*, 1923. Sept. 1. Vol. 38. No. 3. pp. 233–256. [21 refs.]

This paper is a further elaboration of one previously noticed in this *Bulletin* (Vol. 19, p. 548), and describes the method employed by the authors for obtaining cultures of leishmania from the peripheral blood. As described before, 10 cc. of blood are taken from a vein and ejected into a flask containing 50-70 cc. of citrated Locke's solution (sodium chloride 9·2 gm., potassium chloride 0·5 gm., calcium chloride 0·1 gm., sodium citrate 10·0 gm., distilled water 1,000 cc.). The mixture when taken to the laboratory is divided in two 50 cc. centrifuge tubes, which are centrifuged at low speed (five minutes at 750 revolutions per minute with a radius of 20 cm.). The red cells with some leucocytes are then found lightly packed at the bottom while the fluid is cloudy. The fluid, after transfer to another sterile tube, is centrifuged for a similar period at high speed (1,375 revolutions). The sediment which then forms consists almost entirely of platelets and a few red cells and polynuclear leucocytes. On careful search extracellular leishmania have occasionally been found in films of the platelet deposit. The cultures are made by inoculating tubes of N.N.N. medium from the platelet deposit. It was previously stated that the range in pH which permitted growth was limited. Subsequent experience has shown that the limits are much wider and that growth will take place between pH 5·0 and 9·8.

It was found that leishmania were most readily discovered by microscopic examination in films made from the bottom of the centrifuge tube after the first centrifuging. They were less readily detected in the uppermost leucocytic layer. Apparently the infected white cells go to the bottom more easily than those uninfected.

Employing this culture technique, 147 cultures were made from 34 specimens of blood. A culture was obtained in 91·2 per cent. of these. When compared with a series of cultures made from spleen juice it was found that the blood cultures gave a slightly better result.

The effects of treatment with tartar emetic on the possibility of obtaining cultures was also considered. In the series tested it was found that cultures were not obtained after patients had received 12 mgm. of antimony per kilogram of weight. It is not maintained, however, that such a dose is curative.

In the Peking Medical College Hospital the following procedure is now adopted. A 10 cc. sample of blood is taken and after dilution is distributed in the two centrifuge tubes. From one tube a series of cultures is made from the platelet layer after the second centrifuging, while smears are made from the lowest part of the deposit after the first centrifuging. From the second tube a series of cultures is made by inoculating with both the lowest part of the deposit after the first centrifuging and with the platelet deposit after the second. In this way one 10 cc. sample of blood gives one series of blood smears and two series of cultures. The combined results offer the maximum of information. In addition a globulin test may be made from the citrated blood remaining in the syringe after expulsion into the Locke's solution.

C. M. W.

SHORTT (H. E.), SWAMINATH (C. S.) & SEN (Ram Taran). **A Second Report on the Recovery of** *Herpetomonas donovani* **from the Urine of Kala-Azar Cases.**—*Indian Jl. Med. Res.* 1923. Oct. Vol. 11. No. 2. pp. 667–668. [1 ref.]

In a previous communication (this *Bulletin*, Vol. 20, p. 868) the senior author reported the successful culture of leishmania from the centrifuged deposit of the urine of a case of kala azar. Including the original case, nine in all have been examined from this point of view, with the result that cultures were obtained in three. It is evident, therefore, that a certain percentage of kala azar cases of ordinary type excrete *L. donovani* in the urine.

C. M. W.

NAPIER (L. Everard) & DAS GUPTA (B. M.). **Cultural Examination of the Urine in Kala-Azar.**—*Indian Med. Gaz.* 1923. Nov. Vol. 58. No. 11. pp. 530–531. [2 refs.]

Encouraged by SHORTT's success the authors attempted to demonstrate leishmania by the culture method in the deposit of urine of kala azar cases. Sixteen cases yielded negative results, but it is admitted that SHORTT obtained his deposit by centrifuging, while in the investigation described it was the result of standing the urine for two hours.

C. M. W.

DE (Monindra Nath). **An Unusual Complication in an Acute Case of Kala-Azar.**—*Indian Med. Gaz.* 1923. Oct. Vol. 58. No. 10. pp. 484–485. With 1 fig.

The paper describes the case of a Hindu woman aged 35 who was admitted to hospital for extreme anaemia and emaciation. The condition was an afebrile one. The discovery of a fixed fungating mass in the position of the cervix uteri led to a diagnosis of inoperable carcinoma. After death it was discovered that the disease was kala azar and that the condition of the cervix was one of noma. There was no enlargement of the liver or spleen though a heavy leishmania infection occurred.

C. M. W.

D'ASTROS, GIRAUD (P.) & RAYBAUD (J.). **Quatre cas autochtones de kala-azar infantile observés à Marseille.**—*Bull. Acad. Méd.* 1923. July 31. Year 87. Vol. 90. 3rd Ser. No. 31. pp. 114 118.

Cases of kala-azar arising in France have already been recorded (this *Bulletin*, Vol. 20, p. 569). The authors of the paper under review describe four other cases which came under their notice in Marseilles. There was nothing peculiar about these cases, which were all in children between three and four years of age. The clinical picture was "absolutely classic."

C. M. W.

MALLARDI (Mario). **I primi due casi di leishmaniosi curati a Bari.**—*Pediatria.* 1924. Jan. 1. Vol. 32. No. 1. pp. 47–49.

A record of two cases of infantile kala azar which were cured at Bari by intravenous injections of tartar emetic. The one case received 15 injections of 3 cc. of a 1 per cent. solution and the other 0·34 gram of the drug between July 13 and August 22.

C. M. W.

BRAHMACHARI (U. N.). **Chemotherapy of Antimonial Compounds in Kala-azar Infection. Part IV. Further Observations on the Therapeutic Values of Urea Stibamine. Part V. Amino-Antimonyl Tartrates. Part VI. Cumulative and Tolerance Experiments with Tartar Emetic.**—*Indian Jl. Med. Res.* 1923. Oct. Vol. 11. No. 2. pp. 393–404; 405–410; 411–415.

——, DAS (Judhistir) & SEN (Parimal Bikash). **Part VII. The Estimation of Small Quantities of Antimony in Presence of Organic Matter.**—*Ibid.* pp. 417–419.

Part IV.—Nine cases of kala azar which were treated with intravenous injections of urea stibamine are described. In all of them apparent recovery had taken place. Further notes on four cases previously reported as having been cured by this drug (*Indian Jl. Med. Res.* 1922. Vol. 10, p. 492) are appended. The patients are all in perfect health and no relapse has occurred. A note by SHORTT describes the use of the drug in five other cases. In some of these a striking result was obtained. He points out that the advantages of urea stibamine over other antimony preparations are these:—

1. The short course, occupying only two or three weeks, necessary to a complete cure.
2. The rapidity with which the symptoms of the disease disappear.
3. The fact that no symptoms of intolerance were met with in any of the cases.

He adds that the results are actually better than those claimed by Dr. Brahmachari himself.

Part V.—This section is largely chemical and deals with the preparation of amino-antimonyl tartrates. Their leishmanicidal properties have not yet been tested.

Part VI.—The minimal lethal dose for a guineapig of tartar emetic is ·055 gm. per kilo of body weight. The repeated injections of smaller doses into these animals did not give rise to any tolerance towards the drug except rarely. There was generally an indication of a cumulative action which rendered the animals susceptible to the next higher dose.

Part VII.—A method for the estimation of minute quantities of antimony in the presence of organic matter is described.

C. M. W.

SHORTT (H. E.) & SEN (Ram Taran). **Urea Stibamine in the Treatment of Kala-Azar.**—*Indian Jl. Med. Res.* 1923. Oct. Vol. 11. No. 2. pp. 653–659. [1 ref.]

The authors report the treatment of a further 16 cases of kala azar by urea stibamine (see note to paper by BRAHMACHARI). The results have been most satisfactory and the statement is made that the drug is superior to any of the other antimony preparations in general use. In uncomplicated cases of average severity 2 gm. were usually sufficient to bring about a cure. The doses are given on alternate days over a period of 20 days. In long standing cases and some acute infections of a fulminating type larger total quantities given over a longer period were required. Several of the cases had proved resistant to sodium or potassium antimony tartrate. The initial dose was 0·1 gm. and this was increased by 0·05 gm. up to a maximum of 0·25 gm. The drug if it escapes accidentally into subcutaneous tissues gives rise to no irritation, a very important point, especially in the treatment of young children. Its action is rapid, and it is most beneficial in restoring the leucocyte count. The series of cases treated is set out in tabular form. The average amount of drug given to each case is 2·6 gm., while the average number of injections and period of treatment are 12 and 32 days respectively. As the authors remark, when this is compared with the 30 injections and 90 days required for a minimum course of sodium antimony tartrate the advantages of urea stibamine are obvious.

C. M. W.

BRAHMACHARI (U. N.). **Recent Advances in the Antimonial Treatment of Kala-Azar by the use of Urea Stibamine.**—*Calcutta Med. Jl.* 1923. Nov. Vol. 18. No. 5. pp. 481–484. (Discussion pp. 484–490.)

In 1922 (*Indian Jl. Med. Res.*, Vol. 10, p. 496) the author gave an account of his method of preparing urea stibamine or urea antimonyl tartrate, and recorded the improvement which had taken place in eight cases of kala azar which had been treated by intravenous injections of the drug. In the lecture of which the paper under review is the report the author gives his further experiences in the use of the drug, especially in what are termed refractory cases which had proved resistant to treatment with antimony tartrate. Three such cases are described, in all of which more or less prolonged treatment with sodium or potassium antimony tartrate had failed to produce any distinct improvement. Directly urea stibamine was substituted a definite change for the good occurred and there is every reason to suppose that the cases were cured. Major SHORTT's similar experiences with the drug are quoted. It was found that the duration of treatment and the number of injections required for complete cure were less than with any other antimony preparation. It is possible that the drug can be administered intramuscularly, but, though this has been attempted with what appear to be satisfactory results, it is as yet too early to express any definite opinion. The dosage used in the cases treated intravenously was 2 gm. in 9 injections, starting from ·15 gm., and increasing by ·05 gm. twice weekly, 1·6 gm. in 9 injections in doses of ·1 to ·25 gm. during 6 weeks, and 2·85 gm. in 13 injections in doses of ·1 to ·25 gm. during 2 months. The solution of the drug should not be boiled, and at present it is only prepared privately by Dr. Brahmachari himself or his chemical assistants.

In the discussion following the lecture NAPIER stated that a boy aged 12 was treated with 10 injections of urea stibamine, and at the end of four weeks his spleen could no longer be felt. He considered the case as completely cured. An interesting point brought out by NAPIER was that a positive spleen puncture or blood culture after antimony treatment did not necessarily indicate that the disease had escaped control. He knew of two cases which gave positive culture results after a course of sodium antimony tartrate, and were subsequently found to have completely recovered without any further treatment.

C. M. W.

NAPIER (L. E.). **The Treatment of Kala-Azar by Meta-Chlor-Para-Acetyl-Amino-Phenyl Stibiate of Sodium (Von Heyden 471), 11 Cases.**—*Indian Med: Gaz.* 1923. Dec. Vol. 58. No. 12. pp. 578–582. With 1 chart. [8 refs.]

The paper describes the treatment of 11 cases of kala azar with a new drug the name of which appears in the title. It was administered intravenously after solution (1 to 5 per cent.) in distilled water. The largest dose given was 0·5 gm., which was the third dose in this particular case. Nausea and vomiting resulted. The previous dose of 0·4 gm. gave rise to no symptoms. The smallest dose which caused any symptoms was 0·2 gm. In no case were less than 10 injections given. By giving a first dose of 0·2 gm. and subsequent doses of 0·3 gm. on alternate days a course of treatment is completed in 19 days. It is probable that 0·4 gm. must be considered the maximum dose for an adult. In every case treated the improvement was uniformly rapid, and all the cases appear to have been cured in a very short course of treatment

Most of the unpleasant symptoms associated with prolonged treatment with the antimony tartrates are absent. Though it is impossible to dogmatize on such a limited series of cases, the author thinks that undoubtedly this new compound is very much better than antimony tartrate, but whether it is better than " urea stibamine " is as yet impossible to say. One advantage it has—it is a definite compound which will not vary in composition. It is prepared without difficulty and does not deteriorate in the Indian climate.

C. M. W.

NAPIER (L. E.). **The Failure of " Bayer 205 " in the Treatment of Kala-Azar.**—*Ind. Med. Gaz.* 1923. Sept. Vol. 58. No. 9. pp. 415–417. [2 refs.]

The author reports his experience in the treatment of six cases of kala azar with " Bayer 205." Owing to serious consequences described by MOLLOW (this *Bulletin*, Vol. 20, p. 102), only small doses were used in the first four cases. The first case, in an adult, received during 22 days 10 intravenous doses varying from 25-500 mgm., with a total of 2·115 gm. The second case, a child 2½ years of age, also had during 24 days 10 doses, the first 4 of which were given intramuscularly, the rest intravenously; they varied from 10 to 150 mgm. with a total of 0·845 gm. The third case was in a boy aged 10, who received intravenously during 26 days 10 doses varying from 25 to 250 mgm., the total amount being 1·595 gm. The fourth case, also a boy, aged 12, was given on alternate days 5 intravenous doses ranging from 100 to 225 mgm., a total of 0·925 gm. In none of these cases was any improvement noted and spleen puncture after treatment revealed parasites still present. It is reported that three of these cases were afterwards successfully treated with sodium antimony tartrate.

YORKE (this *Bulletin*, Vol 20, p. 572) having reported the probable recovery of a case of kala azar after the use of larger doses of 205, the author treated two other cases. An adult received on alternate days six doses ranging from 0·25 to 1·0 gm. with a total of 4·75 gm., while another received seven similar doses with a total of 5·75 gm. In neither did any improvement follow. They were both cured with sodium antimony tartrate.

The author concludes that the complete failure of the preparation in six consecutive cases can only mean that " Bayer 205 " is valueless in the treatment of kala azar. It is interesting to note that none of the six cases exhibited the violent reaction reported by MOLLOW.

C. M. W.

BUXTON (P. A.). **Canine Leishmaniasis not found in Jerusalem.**—*Trans. Roy. Soc. Trop. Med. & Hyg.* 1923. June 21. Vol. 17. No. 3. p. 212.

The destruction of stray dogs in Jerusalem gave the author an opportunity of examining these animals for evidence of leishmania infection. Of about 1,000 dogs destroyed, 156 on account of their emaciated condition appeared to offer the best chance of discovering such an infection. From the blood, liver, spleen and bone marrow two films were made, but in none of these were any leishmania found; 16 cultures of the marrow were made, and these were likewise negative. Several cases of canine piroplasmosis were met with.

C. M. W.

CASTORINA (Giuseppe). **La reazione di Brahmachari nella Leishmaniosi infantile.**—*Pediatria.* 1923. Nov. 1. Vol. 31. No. 21. pp. 1172–1179. [4 refs.]

The author describes his experiences with the globulin test in kala azar which was described by BRAHMACHARI (this *Bulletin*, Vol. 11, p, 152; Vol. 19, p. 4). It consists in the addition of serum to two parts of distilled water. When positive the mixture becomes turbid and on standing a precipitate forms. In 23 cases of infantile kala azar in Italy the reaction was strongly positive (+++) in 19, positive (++) in two, doubtful (+) in one, and negative in one. In 45 cases of other diseases it was positive in 4, doubtful or slightly positive in 4, and negative in the others. The author's conclusion, which appears to be justified by the protocols, is that the reaction is far more likely to be positive in kala azar than in any other disease, and he disagrees with NASSO (this *Bulletin*, Vol. 20, p. 570), who found it of no value [It may be noted that in the paper by YOUNG, reviewed in this number, it is pointed out that the reaction is positive in kala azar and also in schistosomiasis].

C. M. W.

CASTORINA (Giuseppe). **Lo schema di Arneth nella leishmaniosi infantile prima e durante la terapia antimoniale.**—*Pediatria.* 1923. Dec. 1. Vol. 31. No. 23. pp. 1270–1277. [4 refs.]

As a result of the examination of the blood of 12 cases of infantile kala azar it was noted that the Arneth formula showed a marked deflection towards the right. As improvement took place during treatment there was a gradual return to the normal or even in some cases to the left of the normal.

C. M. W.

LEÃO (Antonio Eugenio de Arêa). [In Portuguese and English. **A Reacção de Wassermann na Leishmaniose. The Wassermann Test in Leishmaniosis.**—*Mem. Inst. Oswaldo Cruz.* 1922. Vol 15. No. 1. pp. 209–219 [Portuguese]; 116–124 [English].

From observations on 60 cases of cutaneous leishmaniasis in Rio de Janeiro it is concluded that this disease *per se* does not give rise to a positive Wassermann reaction. When such a reaction is obtained there is always evidence of associated syphilis.

C. M. W.

CORNWALL (J. W.). **Note on the "Resistant" Forms of** *Leishmania donovani* **found in NNN Cultures.**—*Indian Jl. Med. Res.* 1923. Oct. Vol. 11. No. 2. pp. 587–589.

Row described what he termed resistant forms of leishmania which appeared in old cultures (this *Bulletin*, Vol. 20, p. 103). The author of the present paper points out that there is no evidence that the rounded aflagellate bodies are actually resistant, and that their appearance is probably an indication of exhaustion of the nutrient material in the medium. He concludes with ample justification that they are degenerate phases destined to death unless invigorated by sub-culture in fresh medium.

C. M. W.

i. TRIPPUTI (Vincenzo). **Nota clinica sulla leishmaniosi infantile.**—*Pediatria.* 1923. Nov. 15. Vol. 31. No. 22. pp. 1236–1238.

ii. CASTORINA (Giuseppe). **Un caso di leishmaniosi infantile a decorso molto protratto.**—*Pediatria.* 1924. Feb. 1. Vol. 32. No. 3. pp. 174–176. With 1 fig.

i. This paper records a fatal case of kala azar in an infant five months and twelve days old. It is remarkable in that death ensued twenty-two days after the first signs of illness.

ii. A record of a very chronic case of kala azar in a child The illness commenced when it was five months old and persisted till the time of its death six and a half years later.

C. M. W.

BOSE (Indubhushan). **A Case of Dermal Leishmaniasis.**—*Calcutta Med. Jl.* 1923. July. Vol. 18. No. 1. pp. 308–309. With 1 coloured plate.

The paper records what appears to be a case of oriental sore contracted by direct contact with another case. The patient, a youth of 17, was trying " the strength of his wrist " with another class mate who had a sore on his right hand. Ten days after contact a papule appeared at the base of the little finger and this developed into a typical sore in which leishmania were found. The case is remarkable for the short incubation period, but it must be admitted that the absolute proof, that the sore with which he came into contact was actually one due to leishmania, is wanting. Several other sores due to auto-infection through scratching appeared, but all were cured by intravenous injections of antimony tartrate and local applications of antimony oxide in lanoline.

C. M. W.

VIGNE (Paul) & PRINGAULT (E.). **Gomma sous-cutanée à Leishmanias.** —*Bull. Soc. française de Dermat. et Syph.* 1923. Feb. 8. Vol. 30. No. 2. pp. 99–103. With 2 text figs. [1 ref.]

A case of oriental sore had nine lesions in early stages of development on the left forearm. There was one on the left wrist which was healing and an active one on the right elbow. The nine sores on the left forearm were excised. The wounds healed, as also did the other sores. Two months later there appeared near the left elbow a small subcutaneous nodule over which the skin could be pinched up. It felt like a small subcutaneous lymphatic gland. It was excised and sectioned, and was found to have a capsule of fibrous connective tissue within which was a tissue composed of large cells, embryonic cells, connective tissue cells, some blood vessels and rare polynuclear cells. The tissue had evidently degenerated towards the centre to form an amorphous substance. The interesting feature of the lesion is that it was distinctly subcutaneous in position and was structurally like a gumma. The large cells contained *Leishmania tropica.*

C. M. W.

KLIGLER (I. J.). **Oriental Sore in Palestine, with a Report of a New Endemic Focus.**—*Trans. Roy. Soc. Trop. Med. & Hyg.* 1923. Nov. 15. Vol. 17. No. 5. pp. 334–336. [1 ref.]

In Palestine there are two endemic foci of oriental sore. One is central at Jericho and extends to the Dead Sea, the other is at Kantara. The disease in the latter focus resembles that of Aleppo and differs in certain respects from the Jericho type.

C. M. W.

PUPO (João de Aguiar). **A leishmaniose tegumentar em São Paulo.**—*Ann. Paulist. Med. e Cirurg.* 1923. July-Aug. Year 11. Vol. 14. Nos. 7–8. pp. 59–66. With 7 text figs & 1 map.

Cutaneous leishmaniasis is endemic over the whole of S. Paulo, and is apparently increasing. In 1914 at the Hospital for Venereal and Skin Diseases 13 per cent. of the in-patients were under treatment for this disease, in 1916 there were 26 per cent., and in 1919, 48 per cent. It is sufficiently prevalent to affect seriously the labour conditions, not merely because of the time lost in treatment, but also on account of complications such as tetanus, erysipelas, myiasis and phagedaena which attack many who neglect the local sore. In one district—Albuquerque Lins—as many as 68 per thousand of the population are affected. Until the vector is known and the parasites can be attacked in the transmission stage, the writer recommends that a hospital should be erected in a central town for the adequate treatment of patients by tartar emetic. Baurú is suggested as being readily accessible from the various districts in which the disease prevails at present, and also from Aguapehy, in which direction the country is now developing.

H. Harold Scott.

MONTENEGRO (João). **Leishmaniose em Caẽs.**—*Ann. Paulist. Med. e Cirurg.* 1923. Nov. Year 11. Vol. 14. No. 11. pp. 156–157.

PEDROSO has shown that in S. America dogs suffer from a natural cutaneous leishmaniasis, and that it is possible to infect dogs by inoculating them intradermally with virus from human cases or with cultures of leishmania. In conjunction with BRUMPT an account of four dogs which were thus infected was published. Three of these succumbed to the disease. The author of the paper under review finds that in his experience dogs which have been infected recover in a year or more and that the mortality reported by the earlier observers was due to other causes, such as ill-treatment of the animals. As regards the spread of infection in human cases from the skin to the buccal and nasal mucosa, it appears, as PEDROSO maintained, that this is due to autoinoculation. The view that the parasites are spread by means of the blood stream is not supported by experiments conducted by the author, who failed to obtain any infection after inoculating dogs intravenously.

C. M. W.

i. SERGENT (Etienne) & TRIOLLET (R.). **Chronique du bouton d'Orient en Algérie. Septième cas constaté hors des régions sahariennes.**—*Arch. Inst. Pasteur d'Algérie.* 1923. Dec. Vol. 1 No. 4. p. 612.

ii. OECONOMOU & PETZETAKIS. **Leishmaniose autochtone étendue du pavillon de l'oreille, simulant un lupus vulgaire, guérie par les injections locales d émétine. (Premier cas signalé à Alexandrie.)**—*Bull. et Mém. Soc. Méd. Hôpit. de Paris.* 1924. Jan. 3. Year 39. Vol. 47. 3rd Ser. No. 39. pp. 1846–1852. With 2 figs.

iii. PANAYOTATOU (Angélique). **"Leishmaniose cutanée" ou "Bouton d'Orient" à Alexandrie d'Egypte. Deux cas de localisation inédite.**—*Ibid.* 1923. Nov. 22. Year 39. Vol. 47. 3rd Ser. No. 33. pp. 1527–1532. [2 refs.]

i. A record of a case of oriental sore in an old woman.

ii. The title of the paper sufficiently describes its contents, which call for no further remarks.

iii. The paper records four cases of oriental sore which were successfully treated with local emetine injections.

C. M. W.

RELAPSING FEVER AND OTHER SPIROCHAETOSES.

BAERMANN (G.). **Klinische und experimentelle Untersuchungen ueber Spirochaetenerkrankungen und Spirochaeten (in Deli, Sumatras Ostküste).** [Clinical and Experimental Investigations into Spirochaetal Diseases and Spirochaetes at Deli.]—*Geneesk. Tijdschr. v. Nederl.-Indië.* 1923. Vol. 63. No. 6. pp. 885–921. [25 refs.]

During the period 1913-1919 five cases of a disease resembling Weil's disease occurred amongst the European personnel of the estate adjoining the Central hospital of Petoembockan in Sumatra. Similar cases had been noted previously. Of the five described, four proved fatal. Another case which may be included in the group is the one described by SCHUEFFNER (this *Bulletin*, Vol. 13, p. 300), in which the symptoms were those of blackwater fever. In the blood of the patient there occurred numerous spirochaetes as well as benign tertian malarial parasites. In addition to the severe disease of Europeans there occur other conditions in natives not associated with the serious symptoms of typical Weil's disease. During 1921-1922, six such cases which suffered from jaundice were studied by inoculation of guineapigs. Nothing definite resulted from these experiments. After this a further series of eight similar cases was investigated carefully by inoculation of guineapigs and by culture. In every case leptospira were discovered and the animals contracted severe diseases typical of experimental Weil's disease or infections of a milder type. In some cases the strains were passed to other animals in series. From the animals cultures were obtained, and these proved infective to guineapigs, which responded as they do to strains of Weil's disease virus. In addition to these experiments a series of serological tests were made with sera of known Weil's disease and Japanese seven-day fever. Some of the strains isolated were influenced by these sera, others not. As to the relation of the strains isolated in Sumatra to those of Weil's disease or seven-day fever the author hesitates to give a definite opinion. All that can be asserted is that they belong to the same group of organisms.

In a certain number of unclassified fevers spirochaetes have already been recorded. Thus REIMER (1917) claims to have seen such an organism in Wolhynica fever, and COLES (1919) a spirochaete in the blood of a trench fever case. COUVY and DE LA RIVIERE (1918) also claimed to have discovered a spirochaete in trench fever. SALOMON and NEVEU (1917) recorded the presence of spirochaetes in three cases of trench nephritis. The serum of two of these cases did not protect against *S. icterohaemorrhagiae.* COUVY and BROQUET (1920) discovered spirochaetes in cases of dengue in Beyrout. In all these cases there appears to be some doubt about the observations, and there is no evidence that the organisms actually belonged to the leptospira group. In other cases, however, spirochaetes of this type have been found. MARTIN and PETTIT (1917), and MANINE, CRISTAU and PLAZY (1917) investigated a number of cases of supposed Weil's disease in Lorient and its vicinity. Guineapigs were infected and the organism isolated. In the series of 31 cases, though there was reason to believe that the disease was actually Weil's disease, jaundice was only present in three, while only four died. PETTIT investigated the organism in a series of cases which showed no jaundice. He noted that the organism was most numerous in the blood and urine and that it had no pathogenicity for guineapigs. The serum of convalescents had no effect on the leptospira of Weil's disease. Similar observations were made by CRISTAU, FIESSINGER and NETTER and SALANIER. The isolation of leptospira from seven-day fever of Japan by IDO, ITO and WANI is well known. Similarly in blackwater fever the presence of spirochaetes has been recorded. ASHBURN, VEDDER and GENTRY (1912) claimed to have seen a spirochaete in the blood in Manila. D'ESQUIER (1918-1920) stated that he had seen a possible leptospira in the liver of a fatal case of this disease. BLANCHARD and LEFROU'S observations on blackwater fever lead them to believe that a spirochaete is the aetiological factor in at least some cases.

These observations tend to show that apart from the well-established diseases, Yellow fever, Weil's disease and seven-day fever of Japan, in which leptospira are recognized as the causative agents, there exist other conditions which are associated with similar infections. The investigations recorded in this paper are a definite contribution to the subject, and demonstrate that in Sumatra, apart from the typical Weil's disease from which leptospira highly pathogenic to guineapigs can be recovered, there occur a whole series of milder diseases, associated or not with jaundice, and from which leptospira may with care be isolated. The leptospira may or may not be pathogenic to guineapigs. The less virulent strains on passage through a series of animals may eventually acquire a virulence similar to the organisms of typical Weil's disease. The experiments are in a preliminary stage, but the facts so far as they go offer a field for further research.

C. M. Wenyon.

SNIJDERS (E. P.). **Spirochaetosis ictero-haemoglobinurica en Spirochaetosis ictero-haemorrhagica.**—*Geneesk. Tijdschr. v. Nederl.-Indië.* 1923. Vol. 63. No. 4. pp. 489–499. With 3 plates. [24 refs.]

After giving in tabular form a comparison between the clinical and epidemiological features of pappataci-fever, dengue fever, nanukayami, Weil's disease and blackwater fever, *i.e.*, all diseases lately ascribed to leptospirae, the author points out the uncertainty of differential diagnosis between these diseases. A comparison is made of the anatomo-pathologic picture of Weil's disease and blackwater fever. There is no reason to believe that SCHÜFFNER'S case of febrile haemoglobinuria in Sumatra [this *Bulletin*, Vol. 20, p. 883], in which spirochaetes could be detected, was not blackwater fever. A striking likeness exists between Spirochaetosis ictero-haemorrhagica as it occurs in Sumatran, European and Japanese cases. There may be some relation between Weil's disease and blackwater fever, but at present these diseases must be strictly kept apart. Snijders expects that future research will throw light on these different types of leptospirae.

W. J. Bais.

VERVOORT (H.) **Spirochaeten bij acute koortsige ziekten van onbekenden oorsprong in de tropen. Spirochaetosis febrilis.** [Spirochaetae in Acute Febrile Diseases of Unknown Origin in the Tropics, Spirochaetosis febrilis.]—*Geneesk. Tijdschr. v. Nederl.-Indië.* 1923. Vol. 63. No. 5. pp. 800-839. With 1 folding chart and 6 graphs. [55 refs.]

This paper contains Vervoort's further observations on this subject (see this *Bulletin,* Vol. 20, p. 583). The author summarizes his conclusions as follows :—

1. Dengue-like fevers (Spirochaetosis febrilis) occurring in Deli (E. C. Sumatra), including a few cases with jaundice, are caused by a leptospira (*Leptospira pyrogenes*), which is pathogenic to guineapigs, causing icterus.

2. It has yet to be decided whether these fevers are caused by one or by different species of leptospira.

3. From the blood of fever patients and sufferers from acute enteritis (pseudo-cholera), coarse spirochaetes have been isolated, as well as from sick horses ; the pathogenicity of these has not been proved.

4. For isolation of the leptospira from the blood the nutrient medium must have a pH value of approximately 6·6, whilst for the transmission of the cultures addition of ascites fluid or serum and haemoglobin appears desirable.

5. The coarse spirochaetes may be cultivated in undiluted human or animal serum.

W. J. Bais.

GASTOU (Paul). **Les Spirochaetoses humaines.**—*Rev. Path. Comp. et d'Hyg. Gén.* 1923. Dec. 20. Vol. 23. No. 243. pp. 795-807. [19 refs.]

The author gives a general account of the diseases produced by spirochaetes which are regarded as spirochaetes proper or spirilla. The former he considers as related to the protozoa, the latter to the bacteria. Though a useful summary, the paper contains no new information.

C. M. W.

NOC (Fernand). **Les spirochétoses dans les Colonies Françaises.**—*Congrès de la Santé Publique et de la Prévoyance Sociale. Marseille, 11-17 Septembre 1922. Rapports.* pp. 47-59. [1 ref.]

As the title indicates, this paper deals with spirochaetal infections which occur in the French colonies. It gives a short account of each type of infection and mentions some of the records which have appeared. There is nothing original in the article.

C. M. W.

ZUELZER (Margarete) & OBA (Shiro). **Beitrag zur Kenntnis saprophytischer Spirochäten.**—*Cent. f. Bakt.* I. Abt. Orig. 1923. Oct. 31. Vol. 91. No. 2. pp. 95-101. With 1 plate. [8 refs.]

It has already been noted that water may contain spirochaetes which correspond morphologically with those of syphilis, Weil's disease, relapsing fever and fowl spirochaetosis. Lately a form like *Spirochaeta hebdomadis* of seven-day fever has been found in a similar situation.

Though it resembles *S. icterogenes* (*S. icterohaemorrhagiae*), *S. hebdomadis* is not morphologically identical with it. It is more refractile, thicker, broader and more loosely wound.

Just as the water spirochaetes resemble the pathogenic forms, so do the parasitic saprophytic varieties. The mouth spirochaetes of man resemble forms which occur in water as well as in the intestine of the rabbit and the caecum of guineapigs. The human mouth spirochaete *S. buccalis inequalis* corresponds morphologically with certain intestinal forms of rabbits and guineapigs. In the mouth of man there occurs a form which is peculiar in that the secondary as well as the primary turns are regular and persist during movement. Similar forms are present in large numbers also in the caecum of guineapigs, where also are to be found other spirochaetes resembling *S. dentium* and the finer *S. denticola,* also of the human mouth. The latter organism resembles *S. pallida* and is often referred to as *Treponema denticola.* In certain media, however, it behaves like *L. icterogenes,* and has hooked ends. In stained films the hooked ends are not seen. When like *L. icterogenes* it is with difficulty distinguished from *S. trimerodonta* (syn. *L. trimerodonta* Hartmann), and the two can only be definitely recognised as different when they happen to occur together. It can then be seen that the primary coils of *S. denticola* are looser and deeper than those of *S. trimerodonta.* There is thus considerable difficulty in deciding whether *S. denticola* belongs to the genus *Treponema* or *Leptospira.* It appears simpler and, indeed, more correct to submerge both these genera *Treponema* and *Leptospira* in the genus *Spirochaeta.*

In the mouth as also in the healthy genitalia of human beings there occur organisms which are morphologically indistinguishable from *S. icterogenes.* Morphological resemblance alone is, however, insufficient to establish identity and investigations with the object of testing the relationship of the oral form (*S. trimerodonta*) to *L. icterogenes* are being undertaken. It is possible that the same relationship exists between the harmless spirochaetes of the mucosae and *S. icterogenes* as UHLENHUTH and Zuelzer have shown to exist between the free water living *S. icterogenes* and the strain pathogenic to guineapigs. By mutation and adaptation they may, like the water forms, be able to become transformed from harmless saprophytes into highly pathogenic parasites.

The free living spirochaetes are strict saprophytic organisms which live in dirty water where, through the decomposition of protein in the presence of ammonia, nitrites and nitrates, hydrogen sulphide is freely generated. Such a condition of affairs occurs in the organic felts which form in filters and around the apertures of water taps. Saprophytic spirochaetes often find similarly suitable conditions in the mouth, in decomposing substances in carious teeth, in the intestine, on the mucosae of the genitalia, and in necrotic tissues generally, and in these situations, as is to be expected, more or less dense growths of spirochaetes belonging to the refringens, buccalis, icterogenes, pallida, and recurrent types occur.

NEUMANN has recently expressed it as his opinion that the purely saprophytic spirochaetes which lead a free existence may acquire pathogenic properties. He mentions two rabbits which he believes acquired genital spirochaetosis through contamination from dung or manure. It appears, however, that if a rabbit has previously suffered from this condition mere scarification of the genitalia will cause a relapse. It is possible that Neumann's cases were examples of this kind and not the result of contamination in the manner he imagined. Worms claimed to have induced typical genital spirochaetosis in rabbits by inoculating them with *S. dentium* of the human mouth, but here he produced no proof that the organisms which persisted in the wounds were actually pathogenic to the animals. They may have survived in the wounds merely as saprophytes. Neumann's supposition that non-parasitic saprophytic spirochaetes can quickly change in character and become pathogenic is purely speculative. Such changes may occur, but they do so very slowly, as shown by Uhlenhuth and Zuelzer, who found that the water strain of *L. icterogenes* only became pathogenic to guineapigs after it had been cultivated in serum media for 1¼ years. In this case elaborate tests and experiments were carried out to demonstrate the identity of this strain with the natural pathogenic strain of Weil's disease. In Neumann's experiments on the rabbits the possibility of infection of the wounds from the intestine was not excluded, and though it is possible that the free living forms may change as he supposes, the facts show that if this occurs it does so very slowly.

C. M. W.

Parr (Leland W.). **Intestinal Spirochetes.**—*Jl. Infect. Dis.* 1923. Nov. Vol. 33. No. 5. pp. 369-383. [58 refs.]

The paper records observations which the author has made upon intestinal spirochaetes. He finds that these organisms can be demonstrated in about one-third of the healthy persons about Chicago. This means that a much larger number are actually infected, for the spirochaetes are localized in the caecum and ascending colon, and in many cases do not appear in the faeces. With the exception of the rabbit, most laboratory animals harbour intestinal spirochaetes. Neither in human beings nor in laboratory animals have they been found in the ileum at post-mortem examination. In the common infectious diseases of the country they appear to play no part, though in America, as elsewhere, they occasionally seem to play a secondary rôle in certain cases. The intensity of the infection of healthy persons is slight, the spirochaetes representing less than a twentieth of the entire microbial flora. Some persons always excrete some spirochaetes in every stool, while others never show any. They may survive in stored faeces for a period of seven months. A carbohydrate diet does not favour their development in the intestine, and may even cause them to disappear temporarily. The ingestion of sour milk has the same effect. Protein feeding, on the other hand, may favour them if it does not lead to unbalanced metabolism, which has the opposite effect, as also does fasting. Administration of calomel appeared to have no influence on their abundance. Attempts to infect animals were quite unsuccessful. Under certain conditions the spirochaetes may pass through a Berkefeld N. filter. There is no evidence to show that intestinal spirochaetes have a granule phase. It is finally suggested that it is premature to attempt to classify the intestinal spirochaetes, and owing to the fact that Hogue has demonstrated that one species may show considerable variation in its morphology, it is better at present to refer to all intestinal forms as *Spirochaeta eurygyrata.*

C. M. W.

DELAMARE (G.) & ACHITOUV. **Evolution morphologique de spirochètes fécaux cultivés en bouillon-sérum de cheval.**—*C. R. Acad. Sci.* 1923. Dec. 10. Vol. 177. No. 24. pp. 1331-1333. [1 ref.]

In a special medium consisting of a mixture of 250 parts of ordinary broth and 15 parts of inactivated horse serum through which H_2S gas was allowed to pass (presumably just before inoculation and sealing the tubes), impure cultures of intestinal spirochaetes were obtained. These survived for five months, during which a series of morphologically different forms appeared. As a result of the series the authors conclude that the forms known as *Spirochaeta dysenteriae* are the same as *S. vincenti* (Guiart, Abatucci) and *S. eurygyrata* (Brumpt, Castellani), and that *S. microdentium* is identical with *S. stenogyratum*.

C. M. W.

DELAMARE (G.) & ACHITOUV. **Spirochétoses intestinales à forme d'entérocolite fétide.**—*Bull. Sanitaire de Constantinople.* 1923. Aug. Nos. 19 & 20. pp. 170-177. With 2 plates.

The paper describes in detail two cases of intestinal spirochaetosis, one of them complicated with amoebic infection. The one which is supposed to be purely spirochaetal, as no pathogenic organisms other than the immense number of spirochaetes were present in the stools, responded at once to intravenous injection of salvarsan. The other case received courses of emetine, intestinal lavage and other treatment, but relapse occurred. Innumerable spirochaetes were eventually found in the stools. The case was then treated with emetine and salvarsan, which brought about a cure. The character of the spirochaetes found in these cases is discussed and they are compared with those described by other observers.

C. M. W.

SÉZARY (A.) & POMARET (M.). **L'action Antisyphilitique et Spirillicide des composés Arsénicaux 606, 914, 132 et 190.** *Maroc-Médical.* 1923. July 15. No. 19. pp. 207-209. [4 refs.]

The authors have tested the action of various arsenic derivatives in the case of spirochaetosis in chickens. It was found that when given by intramuscular injection 1 gm. of 606 corresponded with 1·54 to 1·69 gm. of 914 or 132, and with 5 gm. of 190. The preventive and therapeutic efficiency of 190 and 914 given by the mouth were compared, and it was found that, though 190 was decidedly less active than 914 when injected, it was almost equally effective when given by the mouth. It has the advantage over 914 of being more constant in composition and therapeutic value, so that if one can make deductions from the experiments on fowls there is every reason to believe that 190 can be given by the mouth as a prophylactic in syphilis.

C. M. W.

DELPIANO (G.). **Un nuovo metodo "fisico" di dimostrazione delle spironemacee al microscopio. (Nota preventiva.)**—*Pathologica.* 1923. Oct. 1. Vol. 15. No. 357. pp. 581-582.

The author describes a new and simple method for the demonstration of spirochaetes. The film to be examined is dried in the air and then immersed for 10 to 15 minutes in distilled or tap water. It is then dried over a feeble flame and a dry cover glass without mounting material is applied tightly and fixed down with paraffin, or other adhesive material, over the portion to be examined. The film is then examined with the oil immersion lens. The spirochaetes are then clearly visible, as they appear of a dark grey or even black colour. The definition can be improved by manipulation of the condenser. The method was evolved chiefly for the organism of syphilis, but is equally applicable to the spirochaetes of the mouth and those of balanitis. Other organisms, such as cocci and bacilli, can also be identified.

C. M. W.

SELWYN-CLARKE (P. S.), LE FANU (G. H.) & INGRAM (A.). **Relapsing Fever in the Gold Coast.**—*Ann. Trop. Med. & Parasit.* 1923. Oct. 13. Vol. 17. No. 3. pp. 389-426. With 1 map & 7 charts. [12 refs.]

The interest of the outbreak of relapsing fever described in this paper is that it is the first of its kind to be recorded from the Gold Coast. The authors believe that the disease may have been introduced into Accra from Dar-es-Salaam, but there the relapsing fever appears to have been tick-borne, while in the present instance it was undoubtedly conveyed by lice. It may have been an off-shoot of the big epidemic which occurred in Senegal and the French Niger Territory in 1921 (see this *Bulletin*, Vol. 20, p. 132). In support of the latter view it appears that some of the earlier cases were infected in the Northern Territories.

Of 158 cases 139 occurred amongst the Zabramah, Northern Territory tribesmen who disbelieve in water as a cleanser of the human body, and in consequence are in a suitable state to harbour lice. In Accra these people live in very insanitary conditions. Clinically the majority of cases were quite typical, though, as in other outbreaks, a number of atypical ones occurred. Some of these were of a very mild nature and might have been taken for slight attacks of malaria, while others were very severe. Only one case ended fatally. A feature of interest of some of the cases was the disproportion between the severity of symptoms and the height of the temperature. In untreated cases relapses occurred with an apyrexial period varying from two to ten days, while in treated and partially treated cases it varied from two to fourteen days. Of a series of 117 cases, 19 per cent. relapsed on one occasion and 6·8 per cent. twice. One case of what appeared to be reinfection occurred. A European became accidentally infected in April from the blood of an infected rat. He developed the disease seven days later and was promptly cured with novarsenobillon. At the end of June he contracted a severe attack of the disease. The second attack, which can hardly have been a relapse, was again cut short by treatment.

Treatment with novarsenobillon was carried out. After one injection the patients were kept in hospital for 14 days. If a rise in temperature above 99° F. took place, another injection was given even if parasites were not found. Most patients (100) received a dose of 0·3 gm., while others (48) had 0·6 gm. Single injections were given to 117 cases, two to 23, while 8 received 3 doses.

As regards laboratory work it was found that monkeys and black and white rats became infected with the strain, but did not relapse ;

guineapigs and rabbits were refractory, while pouched rats became infected and relapsed. The last named animal proved to be much more susceptible to infection than the other animals tested.

Some experiments with bed bugs and stegomyia yielded only negative results. Experiments with lice gave rise to infection. It appears, as French observers maintain, that the disease is not conveyed by the bites of lice nor by their excretions, but by the inoculation of wounds by crushing the lice on the skin.

C. M. W.

NICOLLE (Charles) & CONSEIL (Ernest). **La fièvre récurrente en Tunisie (Epidémiologie et recherches de laboratoire).**—*Bull. Office Internat. d'Hyg. Publique.* 1923. Dec. Vol. 15. No. 12. pp. 1590-1602. [19 refs.]

A general account of relapsing fever in Tunis and the important work which was carried out at the Pasteur Institute on the aetiology of the disease and the demonstration of the mechanism of its spread by lice. All the information has been published in separate papers elsewhere. It may be noted here that the authors believe that the disease does not differ in any way from the European type, and that there is no reason to suppose that it is caused by a distinct species of spirochaete (*S. berbera*). Immunity tests for differentiation of species are unreliable, for it has been shown that monkeys which have recovered from one infection may later on be reinfected with the same strain of organism.

C. M. W.

REITANI (Ugo) & PARISI (Ennio). **Note cliniche su la febbre ricorrente nelle Somalia Italiana.**—*Policlinico.* Sez. Med. 1923. Oct. 1. Vol. 30. No. 10. pp. 514-528. With 4 charts. [42 refs.]

Having had an opportunity of studying an outbreak of relapsing fever in Somaliland, the author gives a description of the disease as it occurred in the cases he observed. It appears to have been quite typical and responded readily to injections of arsenobenzol derivatives.

C. M. W.

MANTEUFEL (P.). **Die kulturelle Anreicherung von Rekurrensspirochäten als diagnostisches Hilfsmittel am Krankenbett.** [Cultural Enrichment of Relapsing Fever Spirochaetes as Aid to Clinical Diagnosis.]—*Deut. Med. Woch.* 1923. Oct. 26. Vol. 49. No. 43. pp. 1366-1367. [10 refs.]

In many cases of relapsing fever it is impossible to demonstrate the presence of spirochaetes unless one has recourse to animal inoculations. This is often an impracticable procedure, and the author was led to investigate the possibility of applying the culture method to diagnosis purposes. He has discovered a simple enrichment procedure which, in the case of mice, has given good results. A quantity of blood is taken in a sterile glass tube. This is allowed to clot and the clot is separated from the wall of the tube by a platinum wire. One and a-half volumes of a mixture consisting of 80 parts of isotonic salt solution and 20 parts of ordinary peptone broth are added. The tube is then placed in the incubator at 28°-30° C. for 3 or 4 days.

By this time the spirochaetes will have multiplied sufficiently to be recognized. The method has answered in the case of mice, in the blood of which spirochaetes could not be demonstrated, and the author thinks that it will apply to human beings also. He advises the abstraction of 5 cc. of blood to which, after clotting, 7·5 cc. of the mixture of salt solution and peptone broth are added.

C. M. W.

ANDING (Curt Emil). **Arsalytbehandlung des Rückfallfiebers im Stadium der Apyrexie.** [Treatment of Relapsing Fever by Arsalyt in the Apyrexial Stage]—*Deut. Med. Woch.* 1923. Sept. 21. Vol. 49. No. 37-38. pp. 1205-1206. [13 refs.]

Various observers have noted that in the treatment of relapsing fever with salvarsan or similar arsenicals the ultimate result depends largely upon the period of the disease at which the injections were made. In a series of 50 cases treated with arsalyt the author noted that the best result from the point of view of immediate cure and prevention of subsequent relapse were obtained when the drug was given on the 5th or 6th day of the afebrile period. In 20 cases treated according to this principle there were no relapses.

C. M. W.

BUSCHKE (A.) & KROÓ (H.) **Spinale Strangdegeneration nach experimenteller Rekurrens.** [Degeneration of Spinal Cord Tracts in Experimental Relapsing Fever.]—*Deut. Med. Woch.* 1923. Nov. 16. Vol. 49. No. 46. pp. 1435-1436.

In an earlier paper the authors have shown that in experimental relapsing fever in mice the spirochaetes may invade the brain substance like the organism of syphilis. This invasion was not accompanied by any histological changes. In the case of white rats the infection is often of a different type, the animals remaining ill for many weeks without it being possible to demonstrate spirochaetes in the blood. By inoculation of tissues into other animals it has been proved that spirochaetes were actually present in the brain or other organs. In a small number of such animals the symptoms indicated some derangement of the nervous sytem. Histological examinations showed that in the upper part of the spinal cord there was a selective action on certain neurones and definite disease of the posterior column which involved areas into which fibres from the posterior nerve roots entered. These lesions did not correspond completely with those of tabes, but resemble a condition described by SPIELMEYER in trypanosome infections of dogs. Similar degenerations have been recorded in other conditions, such as ergotism and pellagra.

C. M. W.

ILLERT (E.). **Kultivierung von Recurrensspirochäten in künstlichen Nährmedien unter Berücksichtigung ihrer Virulenz für den Menschen.** [Cultivation of Relapsing Fever Spirochaetes in Artificial Media and their Virulence for Man.]—*Ztschr. f. Hyg. u. Infektionskr.* 1923. Sept. 19. Vol. 100. No. 3-4. pp. 350-356. [11 refs.]

In treating paralytics by infecting them with relapsing fever spirochaetes the virus has been obtained from inoculated mice. It occurred to the author that it would be convenient if strains of the organism could be maintained in culture provided the virulence was not lost. He has shown that this is possible by the use of Ungermann's medium, which is made as follows. The serum of a young rabbit in quantities of 0·75-1 cc. is placed in small tubes 7 mm. wide and 6 cm. high. The serum is covered with sterile liquid paraffin and inactivated for one hour at 60° C. Immediately before inoculation with spirochaetes a small quantity of fresh rabbit's blood is introduced into the serum by means of a pipette passed through the layer of paraffin. The tubes are inoculated with infective blood or from other cultures by means of a pipette in a similar manner. The culture is incubated at 37° C. The maximum growth occurs at the end of five or six days, when 10-20 spirochaetes will be seen in each dark field. The cultures should be examined after two or three days' incubation, when, if no growth has occurred, other tubes can be inoculated. By this means a strain has been sub-cultured 36 times during seven months. The European strain when inoculated directly from mice to human beings fails to give rise to infection, and the cultural forms are also non-pathogenic. The African strain readily infects man when inoculated from mice or cultures. The virulence of the cultural forms was still maintained after 25 sub-cultures during a period of five months.

C. M. W.

ARISTOWSKY (W.) & HÖLTZER (R.). **Bemerkungen zur Morphologie der** *Spirochaeta obermeieri*.—*Cent. f. Bakt.* 1. Abt. Orig. 1924. Jan. 14. Vol. 91. No. 3-4. pp. 175-181. With 1 plate.

The authors have been able to maintain cultures of *Spirochaeta obermeieri* for a year and a-half, during which it has passed through 200 generations of sub-culture. Two different media were used. One was made by adding to 8 cc. of physiological saline solution 4 cc. of the serum of young horses and a piece of the blood clot from the same animal or of man. The other medium was similar, but in place of the clot a piece of the white of a hard boiled egg was used. When a culture is commenced tubes of both media are inoculated with 1-3 drops of infected blood. The tubes are plugged with cotton wool and incubated at 35° C. As a rule sub-culture has to be made every 48-72 hours. If growth occurs in the one medium it is well to sub-culture into both media. Maximum growth occurs on the 2nd to the 4th day, after which signs of degeneration appear in the spirochaetes. Marked variation in size of the organism is a notable feature. They may have as many as fifty coils or only three or four. The largest forms occur in the second medium, especially when several successive sub-cultures have been made in it. When the long forms are numerous sub-culture often fails. In other cultures the shorter forms predominate, while in old cultures from the 5th day onwards "shadow forms," which are finely granular, appear. Sub-culture of cultures rich in small forms often fails, but when successful long forms tend to appear. The authors disagree with observers who claim that the small forms are young, active ones. Apparently unfavourable conditions may give rise to short or long forms. The most healthy forms are those with 10-12 turns like the blood forms. Cultures rich in these are best for sub-culture purposes.

Though reproduction by division into two is the rule, division into 3 or 5 parts commonly occurs.

As regards the character of the spirochaetes, many are regularly coiled. Others, however, show irregularities or are entirely devoid of coils. The irregularly coiled spirochaetes are most active when observed by dark-ground illumination. Occasionally a dividing form will be seen with one half coiled and the other half devoid of coils. Besides the shadow forms, degenerating cultures show structurally normal but non-motile forms, on many of which are curious centrally-placed bodies which appear as minute rings under the dark field and as intensely violet spheres when stained by Giemsa stain. Every transition between the shadow forms and normal spirochaetes occurs.

In some cultures clumps of spirochaetes are found. These are formed first by two organisms becoming attached, and gradually, by the addition of others, clumps of 10 or more individuals are formed. Similar clumps occur in the blood towards the end of a febrile period, and their formation is usually attributed to the presence of agglutinins in the blood. As they occur in cultures this explanation can hardly be correct. It seems that in a series of sub-cultures this clumping appears periodically, and as the cultures containing them are readily sub-cultured it does not appear as if the phenomenon is one of degeneration. The coiling of the spirochaetes into rings has been observed occasionally. Many explanations of this have been advanced, but the authors can offer none. They have seen it only in 3 or 4 of the 200 sub-cultures.

It is evident that the cycle of development in cultures reveals periodic variations. The strain for a time will only show 3-5 spirochaetes per field, while in later sub-cultures the number is increased to 30 or 40. Later still it will revert to the smaller number. A similar periodicity is observed in the appearance of clumps and other features. The authors believe that this periodicity is an indication of a definite life cycle, and that the periodicity of the disease in man is dependent, not upon the development of immunity, as is generally supposed, but upon the cycle of development of the parasite.

C. M. W.

RODHAIN (J.). **Sur la réceptivité des roussettes épaulières,** *Epomophorus Wahlbergi Haldemani* **Hallowell et** *Micropteropus pusillus* **Peters au** *Spirochaeta Duttoni* **Todd.**—*Bull. Soc. Path. Exot.* 1923. Dec. 12. Vol. 16. No. 10. pp. 729-733. [1 ref.]

In an earlier paper (this *Bulletin*, Vol. 19, p. 556) VAN DEN BRANDEN and VAN HOOF showed that the fruit bat, *Eidelon helvon,* could not be infected with the spirochaete of African tick fever. The authors have experimented with other bats in the Congo. These were *Epomophorus wahlbergi haldemani* and *Micropteropus pusillus.* Both, especially the latter, are readily infected by inoculating them either with crushed ticks or with infected blood, and the disease produced is a fatal one.

C. M. W.

JOURNAL OF THE ROYAL NAVAL MEDICAL SERVICE. 1924. Jan. Vol. 10. No. 1. p. 40.—**Naval Medical History of the War. Section of Tropical and Sub-Tropical Medicine. Part VI.—(iii) Typhus and Relapsing Fever.**

Though relapsing fever and typhus were very prevalent at the naval base in Bessarabia during the spring of 1917, by strict anti-vermin rules the force was kept entirely free from both diseases.

C. M. W.

RISQUEZ (Jesus Rafael). **La Espiroquetosis bronquial en Venezuela.**—*Gac. Méd. de Caracas.* 1923. July 15, 31, Aug. 15, 31, Sept. 15 & 30. Vol. 30. Nos. 13, 14, 15, 16, 17, 18. pp. 193-197; 209-219; 225-227; 241-245; 257-265; 273-283. With 2 maps & 2 coloured plates. [42 refs.]

This series of papers comprises a full account of bronchial spirochaetosis in all its bearings as it occurs in Venezuela. The question is dealt with in four parts, each with chapters and sub-headings.

Part I. treats of the history of the disease in different countries and in Venezuela in particular. The first case recorded in Venezuela was by LUCIANI in 1919; since then there had been 8 others, and the author now brings forward 66 more. The morphology and the position of the parasite in the animal kingdom are next discussed.

In Part II. a general account of the disease is given. Of the 66 cases, 38 were males and 28 females. Thirty-nine were between the ages of 22 and 32 years. A large proportion had suffered previously from catarrhal affections of the throat and respiratory tract, and in 4 per cent. tuberculosis was associated. Cough was a prominent symptom, often accompanied by pain in the chest. The expectoration was viscid, usually fetid and in a third of the cases blood-stained. At the onset there was fever which often led to a diagnosis of influenza. The author next discusses the question as to whether bronchial spirochaetosis is a distinct clinical entity and decides in the affirmative on the following grounds: 1. The organism differs from the ordinary mouth spirochaetes in several particulars—motility, production of coccoid forms, staining properties, etc.; 2. It is not found in healthy subjects nor in patients with ordinary catarrh; 3. It disappears as the symptoms clear up.

In this part the morphology is again considered and in greater detail. From examination of 100 specimens the average length was 8·4 microns, and the number of turns 4·72. The prognosis is, on the whole, favourable, though many cases become chronic, but no deaths resulted among the 66 recorded here.

Part III. is concerned with treatment. The most satisfactory is that by intravenous tartar emetic. A 1 per cent. solution is used and the initial dose is 0·5 cgm., increasing daily to a maximum of 8 cgm., a total of 0·5-1·5 gm. being given in 50-60 days.

The same drug has also been given by mouth in a dose of 5 mgm. with codeine, or with iodide of potassium, or with syrup of tolu and chloroform water. Other drugs employed were arsenic in the form of Fowler's solution (maximum dose 10 minims) or neosalvarsan, 0·15 gm. daily.

Part IV. gives details of 32 cases, their histories, physical condition, symptoms, diagnosis and details of treatment. Finally, there is a general summary of the results of examination of the sputum of the two hundred patients, which may be tabulated thus:—

	Men.	*Women.*	*Children.*	*Total.*	*Percentage.*
With Spirochaetes only ..	24	31	3	58	29
With B. tuberculosis only ..	24	22	0	46	23
With Spiroch. & B tuberc...	4	4	0	8	4
With neither Spiroch. nor B. tuberculosis	44	39	5	88	44
TOTALS	96	96	8	200	

H. Harold Scott.

LABERNADIE (V.) & PEYRE (E.). **Apparition de la broncho-spirochétose en Guyane française.**—*Bull. Soc. Path. Exot.* 1923. July 11. Vol. 16. No. 7. pp. 476-478.

The paper is a record of the first case of spirochaetal bronchitis to be observed in French Guiana. There was an irritating cough with blood-stained expectoration consisting of serous fluid with islets of mucoid material in which spirochaetes were numerous. Repeated search for tubercle bacilli and eggs of Paragonimus were negative. The patient also suffered from benign tertian malaria. Treatment with quinine and symptomatic remedies to ease the cough were the only ones adopted, as the case was a mild one.

C. M. W.

RAT BITE FEVER.

Low (George C.). **A Case of Rat-Bite Fever in England. Recovery of the Spirochaete from the Blood.**—*Brit. Med. Jl.* 1924. Feb. 9. p. 236.

According to the author, the case was of interest because of its typical clinical signs and the fact that the specific germ was isolated. As regards the organism the author states that Wenyon says it is not a *Leptospira* and that probably it will have to be included in the *Spironema* group. [As a matter of fact, the reviewer did not suggest the *Spironema,* but the *Spirillum* group.]

C. M. Wenyon.

Fróes (Heitor Praguer). **Considerações sobre o Sodóco.** [Rat-bite Fever.]—*Brazil Medico.* 1923. Dec. 8. Year 37. Vol. 2. No. 23. pp. 339-341.

An account of a fatal case of fever of a relapsing fever type in a woman aged 60 years who had an unhealed wound on the dorsum of the foot, the result of a rat bite. From the clinical picture rat bite fever was diagnosed, this being the sixth case to be recorded from Brazil.

C. M. W.

Ciaccia (Salvatore). **Contributo clinico alla conoscenza del sodoku.**—*Pediatria.* 1924. Jan 15. Vol. 32. No. 2. pp. 92-100. With 1 text fig. and 1 chart. [27 refs.]

A detailed account of a case of rat-bite fever in a child in Italy. The illness lasted for about two months and a cure was effected by intramuscular injections of neargirol. The temperature, which was taken throughout, is shown in an instructive chart. Attempts at discovery of the organism in the blood failed, though on one occasion urine, which was taken with precautions to exclude contamination, contained a spirochaete somewhat larger than *Treponema pallidum.*

C. M. W.

Giraldi (Stefano). **Due casi di Sodóku.**—*Policlinico.* Sez. Prat. 1924. Jan. 14. Vol. 31. No. 2. pp. 44-47. [10 refs.]

A description of two cases of rat-bite fever in Italy in which the organisms were not discovered.

C. M. W.

Bezzi (Giovanni) & Moratti (Nello). **Un caso di Sodóku.** *Policlinico.* Sez. Prat. 1924. Jan. 14. Vol. 31. No. 2. pp. 48-49. [5 refs.]

A record of a case of rat-bite fever in a child seven years of age.

C. M. W.

INFECTIOUS JAUNDICE.

SCHÜFFNER (W.) & KUENEN (W. A.). **Het voorkomen van spirochaeten van het type der** *Sp. icterohaemorrhagiae* **bij ratten in Amsterdam.** [Occurrence of Spirochaetes of the Type of *Sp. icterohaemorrhagiae* among Rats in Amsterdam.]—*Nederl. Tijdschr. v. Geneesk.* 1923. Nov. 17. 67th Year. 2nd Half. No. 20. pp. 2018–2026. With 1 fig. & 1 plate. [18 refs.]

One hundred and twenty-four adults of *Mus norvegicus* (length without tail exceeding 200 mm.) were found infected to the extent of 45 per cent. with leptospira, 83 young ones (under 200 mm.) to the extent of 2 per cent., and 29 *Mus rattus* from ships to the extent of 3 per cent. The incidence of *Tryp. lewisi* among these 3 groups was respectively 11, 16 and 17 per cent. It is pointed out that this low incidence among the young ones is surprising, considering the high chance of infection to which they are exposed.

Within the kidneys of naturally-infected rats, the leptospirae are not evenly distributed, but are localized in distinct foci. Moreover, they are not situated within the tissue (as in guineapigs, infected experimentally), but are to be found in the lumen of the tubuli contorti, where thick layers of leptospira cover the epithelium. The renal infection may be the last stage of a former generalized infection (like the infection of the gallbladder in typhoid), but it might also be the result of an ascending infection, starting from the urinary tract and stopped by the barrier of the renal epithelium.

Several guineapigs were successfully inoculated with the murine leptospira. They died after 6-14 days, on first subinoculation after 7-8 days, on second subinoculation after 6 days. Haemorrhages and icterus were usual, sometimes without leptospirae being found. The leptospirae are found principally in the liver if death supervene very quickly; otherwise the kidneys harboured most of them. Spirochaeturia did not occur before the 7th day. In surviving animals it continued for more than three months. Inoculation of young rats caused no illness, but three of them developed spirochaeturia, lasting more than three months.

Tap water was found to contain spirochaetes of the leptospira type.

N. H. Swellengrebel.

KAI (Toshihiko). **[Ueber die Resistenz der roten Blutkörperchen bei Spirochetosis ictero-haemorrhagica japonica.]**—*Fukuoka Ikw. Daig. Z.* 1921. Vol. 14. pp. 513-564. [Summarized in *Japan Jl. Med. Sciences.* Tokyo. 1922. Vol. 1. No. 1. p. 69.]

The author arrives at the following conclusions:—

1. In the febrile stage the resistance of the red blood corpuscles is increased against hypotonic saline solution but decreased against saponin. The degree of resistance is chiefly dependent on the fever and jaundice.

2. The above changes become more marked with the advent of jaundice and bear a direct relation to its intensity and to the degree of anaemia.

3. During convalescence a return to the normal takes place gradually.

4. There is a direct connection between the degree of change in resistance of the red blood corpuscles and the severity of the disease.

C. M. Wenyon.

TOYAMA (Yuzo). **[Results of the Experiments for destroying** *Spirochaeta icterohaemorrhagiae* **from the Agricultural Point of View in Toyama Prefecture.]**—*Jikken Ig. Z.* Tokyo. 1921. Vol. 5. pp. 14-28. [Summarized in *Japan Jl. Med. Sciences.* Tokyo. 1922. Vol. 1. No. 2. pp. 201–202.]

—— **Result of the Prophylaxis of Weil's Disease** (*Spirochätosis icterohaemorrhagica*) **experimented both in Toyama and Chiba Prefectures.**—*Scientific Reports from Govt. Inst. for Infect. Dis., Tokyo.* 1922. Vol. 1. pp. 197–201.

The prevalence of Weil's disease is closely associated with conditions of the soil, and in Japan all infected districts are paddy fields or localities with swampy ground. It was noted that owing to the number of cases which occurred farmers became reluctant to work the fields. Having determined that the organism causing the disease will survive in experimental paddy fields, the author experimented with various fertilizers with a view to finding one which destroyed the organism. Calcium cyanamide was found to be a satisfactory agent. A practical test was carried out by selecting three areas known to be heavily infected and applying the chemical to the extent of five "kwan" per "tan" (18·78 kilogrammes per 991·73 sq. metres). The areas chosen varied in extent from about 26 to 47 hectares—the observations extended over seven months. The average number of daily workers on the three fields were 236, 462 and 120. After the soil had been treated in the three areas only a single case of the disease occurred in one of the areas, while in the surrounding fields it was as prevalent as before. Furthermore, the use of the chemical improved the yield of rice, but it is admitted that this good result cannot be attributed entirely to the use of calcium cyanamide, for other fertilizers were used as well.

C. M. W.

PETTIT (Auguste). **Conservation du virus de la spirochétose ictérohémorragique.**—*Bull. Acad. Méd.* 1923. Nov. 6. Year 87. 3rd Ser. Vol. 90. No. 37. pp. 310–312.

The author discusses the difficulties of keeping strains of *Spirochaeta icterohaemorrhagiae.* Neither in cultures nor in inoculated guineapigs can one be sure that multiplication will take place. For some reason or another cultures will suddenly fail, while guineapigs, especially such as have been employed previously for the titration of therapeutic sera, will not respond to inoculation. The animals may die of intercurrent infections which kill the subinoculated animals. In such cases the spirochaete can sometimes be recovered by inoculating the urine found in the bladder after death ; it is less likely to be infected with the intercurrent organism. By combining both the culture and inoculation methods there is a reasonable chance of maintaining a strain. By this means one has been kept since September 1916.

C. M. W.

BEGER (H.). **Ueber aktive Immunisierung mit "gekupferten" Spirochätenkulturen bei der Weilschen Krankheit.** [Immunization with Copper-treated Spirochaete Cultures in Weil's Disease.]—*Cent. f. Bakt.* I. Abt. Orig. 1923. Oct. 31. Vol. 91. No. 2. pp. 90–95. [15 refs.]

By the adoption of LAUBENHEIMER'S method* of killing organisms for vaccine purposes the author has been able to prepare a vaccine of *Leptospira icterohaemorrhagiae* in which the organisms are killed without the damage which always results if other methods such as heat are employed. By immersing in the suspension of organism a piece of copper foil they are all killed in the course of 4 or 5 hours without having altered structurally. By the use of such a vaccine administered intraperitoneally to guineapigs the animals may be completely immunized against subsequent inoculations with highly virulent strains of leptospira.

C. M. W.

OBA (S.). **Ueber das Agglutinin von** *Spirochaeta ikterohaemorrhagiae*, **insbesondere eine Nachweismethode dafür und die Agglutininuntersuchung bei der experimentellen Weilschen Krankheit des Kaninchens.** [The Agglutinin of *S. icterohaemorrhagiae*, its Demonstration and Study in Experimental Weil's Disease in the Rabbit.]—*Aichi Jl. Experim. Med.* Nagoya. 1923. Mar. 31. Vol. 1. No. 1. pp. 1–20. [17 refs.]

——, KATAYAMA (T.) & SUMI (K.). **Die Identifizierung der** *Spirochaeta ikterohaemorrhagiae* **und** *Spirochaeta hebdomadis* **mittels des Agglutinationsverfahrens.**—*Ibid.* pp. 20–28. [3 refs.]

These two papers deal with the phenomenon of agglutination of *Spirochaeta icterohaemorrhagiae* and *S. hebdomadis*. The first paper, which deals with the former organism, finishes with the following conclusions :—

1. The agglutination of *Spirochaeta icterohaemorrhagiae* can be demonstrated by the addition of an homologous serum to the culture of the organism in a serum agar medium. The spirochaetes cease to move and form thick clumps of motionless individuals so that they can be easily distinguished from those in the control culture.

2. Heating the serum for two hours at 60°C. on three successive occasions has no effect on the agglutination, whereas heating at 70°C. for 60 minutes destroys the agglutination to a large extent.

3. The normal sera of men, horses, sheep, goats, rabbits, dogs, guineapigs, white rats, and chickens possess no substances which agglutinate *S. icterohaemorrhagiae.*

4. Large rabbits weighing over 2,000 gm. become ill after the intrahepatic injection of fairly small doses of the organism.

5. In experimental Weil's disease of rabbits the agglutinin appears in the blood after ten days and reaches its maximum in four weeks. It is clearly demonstrable in the blood for over four months.

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*LAUBENHEIMER (K.). Über die Einwirkung von Metallen und Metallsalzen auf Bakterien und Bakteriengifte. Versuche zur praktischen Verwertung der oligodynamischen Wirkung von Metallen.—*Zeitschr. f. Hyg. u. Infektionskr.* 1921. Mar. 5. Vol. 92. No. 1. pp. 78-114.

6. The demonstration of the agglutinin value of a serum by this method reaches approximately the same standard of reliability as does the usual agglutination test as applied to motile bacilli like those of typhoid.

The second paper describes the differential agglutinins of the two organisms. *S. hebdomadis* behaves with its homologous serum like *S. icterohaemorrhagiae*, but each is strictly specific for its corresponding serum. A rabbit may have in its blood at the same time and independently both agglutinins, while both organisms can be recovered from the blood of a rabbit three days after intrahepatic inoculation. Rabbits immunized against one of these organisms are refractory to inoculation with this organism alone and are not protected against the other.

The technique of performing the agglutination test is described in detail. In each of a series of test tubes are placed 2 cc. of a weak agar (·4–·5 per cent. agar in Ringer's solution). These are sterilized in the steamer and then placed in a water bath at 37° C. To one tube is added ·5 cc. of immune serum of a rabbit or, if human serum or that of an animal other than the rabbit is used, ·5 cc. of normal rabbit serum as well. The volume of the liquid in the tube is then doubled by the addition of an equal part of the melted agar. To other tubes normal rabbit's serum is added in the place of the immune serum. Before the tubes have set they are inoculated with a drop of culture or with infected blood. In the first tube after incubating for 2 to 3 days at 37° C. will be found clumps of agglutinated motionless organisms, while in others the organisms are motile and scattered.

C. M. W.

LAROCHE (Guy) & DAUPTAIN. **La réaction du benjoin colloïdal dans la spirochétose ictéro-hémorrhagique.**—*C.R. Soc. Biol.* 1923. Oct. 27. Vol. 89. No. 29. pp. 870–871.

In a case of Weil's disease which was complicated by severe meningeal symptoms and the presence of much albumen, bile pigments and cells (200 per cubic millimetre) in the cerebrospinal fluid, the benzoin colloidal reaction* was tested on two occasions. In spite of the intensity of the lymphocyte reaction and the presence of bile pigments the reaction was quite negative.

C. M. W.

LECONTE (M.) & JOLTROIS. **Un cas de spirochaétose ictéro-hémorragique avec iritis et névrite optique.**—*Bull. et Mém. Soc. Méd. Hôpit. de Paris.* 1923. Oct. 25. Vol. 39. 3rd Ser. No. 29. pp. 1366-1369.

A case of Weil's disease is described in which the usual congestion of the conjunctiva was followed by more serious ocular disturbance in the shape of iritis and optic neuritis. It is supposed that the involvement of the eyes was consequent upon meningeal complications.

C. M. W.

OBA (Shiro), KATAYAMA (Takeichi) & WASHIMI (Kenichi). **[On the Differential Diagnosis of** *S. icterohemorrhagica* **and the Spirocheta of Seven-Day Fever by Agglutination Test.]**—*Eisei. Densen. Z.* Tokyo. 1921. Vol. 17. pp. 59-66. [Summarized in *Japan Jl. Med. Sciences.* Tokyo. 1922. Vol. 1. No. 2. p 193.]

OBA (Shiro). **[On Agglutinin of** *Spirochaeta icterohemorrhagica.*]—*Eisei. Densen. Z.* Tokyo. 1921. Vol. 16. pp. 172-203. [Summarized in *Japan. Jl. Med. Sciences.* Tokyo. 1922. Vol. 1. No. 2. p. 193.]

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* The colloidal benzoin test of the cerebrospinal fluid is described by WRIGHT (H. D.) and KARMACK (W. O.) in the *Edinburgh Med. Jl.* 1923. Aug. Vol. 30. pp. 352-367.

YELLOW FEVER.

WHITE (R. O.). **Yellow Fever in the Gold Coast; Its Endemic and Epidemic Character.**—*Ann. Trop. Med. & Parasit.* 1923. Oct. 13. Vol. 17. No. 3. pp. 431–437. [5 refs.]

The author believes that the outbreak which occurred in different parts of the Gold Coast in 1923 was undoubtedly yellow fever. In all cases there was black tarry or coffee-grounds vomit, marked diminution in the quantity of urine—amounting in some cases to complete anuria—albuminuria associated with symptoms of extreme urgency, followed rapidly by death. Post mortem there was fatty degeneration of the liver and kidneys. Other symptoms recorded were haemorrhage from the mucous membranes, conjunctival injection, varying degrees of jaundice, Faget's sign and high fever. With one exception the fatal termination occurred within a week of the onset of illness.

There is not the slightest ground for believing that the disease was imported, so that it must be assumed that yellow fever exists in W. Africa in some latent form requiring special conditions for its development. That such are required may be gathered from the infrequency with which Europeans are attacked, notwithstanding that the factors for the spread of yellow fever—the virus, the carrier and the non-immune—are always present. It was supposed that the European was protected by mild and unrecognized attacks, but this is ruled out, for individuals have succumbed to it after thirty years' residence. The European is the obvious non-immune, yet the records of yellow fever epidemics show that long intervals occur between outbreaks in any one place and that they are all traceable to a non-European source. The disease when it attacks Europeans is invariably fatal and is of such a character that it cannot be overlooked, while the intervals that elapse between outbreaks amongst them are proof that Europeans are not responsible for the fact that yellow fever is endemic in W. Africa. On the other hand, the indigenous native, dissociated from the new-comer, is incapable of maintaining the virus. So long as the native remains in his own district he is relatively immune, but directly he moves to another locality this immunity breaks down and he becomes more susceptible to yellow fever. He contracts the disease in a mild form which, however, gives the virus an impetus. Ultimately it becomes so enhanced as to give rise to definite illness. Finally, when living conditions make it possible, it is handed on to Europeans. The strain at this stage has reached a high degree of virulence, and if the disease is not checked by mosquito control will be capable of infecting the otherwise insusceptible native.

The infected native rather than the infective mosquito is responsible for the spread of the disease. If the former can be kept from close living contact with the European there is reasonable prospect of preventing the outbreaks. Efforts at controlling the mosquito have hitherto met with little permanent success, though temporarily the Stegomyia index of 80 per cent. can be reduced to 5 per cent. by a week's intensive work. The effectiveness of such measures suggests the advisability of instituting a "cleaning-up" week at least once a year in every town where cases of yellow fever have been known to occur within the last twenty years.

C. M. Wenyon.

GOUZIEN (P.). **Manifestations amariles au Dahomey et en Guyane française, en 1923.**—*Bull. Office Internat. d' Hyg. Publique.* 1923. Dec. Vol. 15. No. 12. pp. 1565–1570. [1 ref.]

In the two colonies mentioned in the title small outbreaks of yellow fever occurred in 1923. By immediate sanitary measures these were cut short. At Dahomey there were five cases amongst Europeans, four of which proved fatal. An enquiry showed that the small epidemic was not the result of importation of infection by ships. The natives are not immune, as is often supposed, while the European affords only an apparent link in the yellow fever chain. Natives suffer from diseases associated with jaundice which might legitimately be diagnosed yellow fever. The case of a native child two years of age, who died after an acute illness associated with violent bilious vomiting and evacuation per rectum of blood, is mentioned. A similar case in a child was seen by the author during the epidemic in the Sudan in 1906. A few days later an employee in the postal service died of yellow fever. It seems probable that both the children suffered from the disease in an atypical form. The author emphasizes the difficulties in dealing with natives in such matters. Their superstitions are a serious handicap to proper surveillance. The cause of the 1923 outbreak at Dahomey was not determined, but it is reasonable to suppose that it was carried there by road in unrecognized form in natives possibly from the Gold Coast. The author believes that if it were possible to live intimately with the native and follow his daily life cases of yellow fever, modified in various ways according to age and other circumstances, would quickly come to light.

As regards the Guiana cases, there were two of these, one in a European and the other in an Arab. In spite of careful enquiry it was impossible to discover the origin. Not a single case had been recorded from this country since 1892. The author recalls the fact that a characteristic case of yellow fever was noted in Martinique in 1921 and that this colony is visited almost yearly by an " inflammatory fever " which differs from yellow fever in being less severe and in having a lower mortality rate.

The author believes that yellow fever is maintained amongst the natives, who suffer in a modified degree, and that the disease exists in other forms than the typical one, so that definite diagnosis becomes exceedingly difficult. The control of yellow fever demands constant vigilance and a system of exchange of information between the countries interested.

C. M. W.

VIEIRA (Borges). **Pesquisas sobre a febre amarella na Bahia. (Conferencia feita na Sociedade de Medicina e Cirurgia de S. Paulo.)** [Researches on Yellow Fever in Bahia.]—*Ann. Paulist. Med. e Cirurg.* 1922. Mar. Year 10. Vol. 13. No. 3. pp. 59–72. With 9 charts in text.

This is an interesting account of researches into an outbreak of yellow fever in Bahia in 1921. From the description of the disease there would appear to be no doubt as to its nature, all the typical symptoms of yellow fever being present. The following researches were undertaken: 1. Isolation of the *Leptospira icteroides*. Blood was obtained from 7 patients; 3 on the fourth day, 3 on the fifth, and 1 on the second and again on the fourth. The last case terminated fatally. Neither by direct dark-ground examination, by inoculation into guinea-pigs, nor by cultural methods were positive results obtained.

2. Pfeiffer's reaction with sera of patients recently attacked and cultures from NOGUCHI's laboratory. Seven were thus tested, 4 benign cases, 2 of average severity, and 1 grave. All proved negative.

3. The use of *L. icteroides* vaccines and antisera. Nothing of importance could be deduced from the use of the former. The latter was injected in a dose of 15 cc. intravenously into a child of 10 years on the 16th day of disease. Though the injection was well tolerated death occurred three days later.

The author concludes either that the disease was not yellow fever, though the symptoms appeared typical and the diagnoses were made by those who had had experience of this disease, or that the causal agent was not the leptospira isolated by NOGUCHI, or, lastly, that some defect in technique had led to the persistently negative results in his hands. From the description given, however, every care seems to have been taken both in obtaining the materials and in carrying out the tests.

H. Harold Scott.

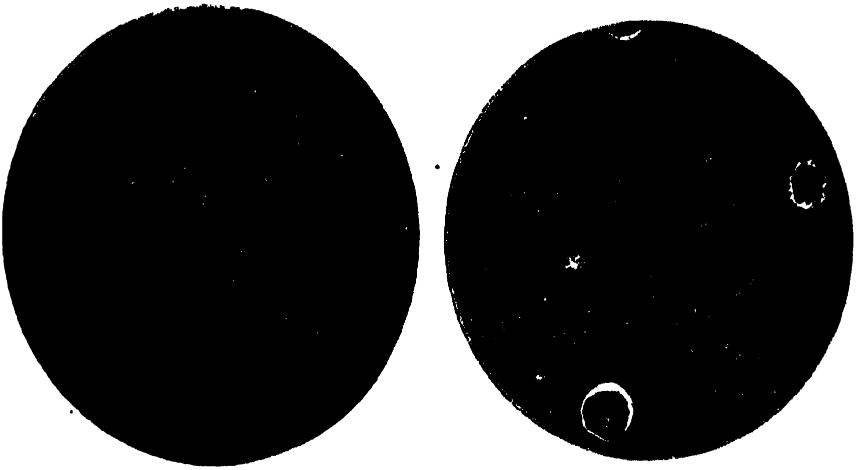
DENGUE.

KNOWLES (R.) & DAS GUPTA (S. A. S. Biraj Mohan). **On a Pseudo-Organism in the Blood in Dengue.**—*Indian Med. Gaz.* 1924. Jan. Vol. 59. No. 1. pp. 11–26. With 6 figs. and 4 charts. [21 refs.]

Though the painstaking investigations described in this paper finally led to the conclusion that the spiral structures seen by the authors in the blood of dengue patients in Calcutta, at first thought to be leptospira, were in reality nothing more than artifacts, they serve a most useful purpose in indicating the difficulties surrounding such an enquiry and sound a note of warning to others who may casually discover similar structures in the blood of patients suffering from dengue or any other febrile disease. Not only were these pseudo-spirochaetes found in the blood of dengue patients but they occurred also in primary cultures in the Wenyon-Noguchi medium made with rabbits' or human blood, in rabbits and monkeys (but not in guineapigs) inoculated with the blood of dengue patients and in cultures from these animals. There appeared, therefore, very good reason to suppose that a true organism was under observation. Several disconcerting features, however, revealed themselves. It was not possible to obtain stained preparations of the supposed organism from the blood of patients or from inoculated animals, though stained films of the cultures revealed them. Their morphology, however, was different in the stained films from that in the fresh dark-ground preparations. Though present in primary cultures they did not appear in sub-culture. The direct examination of healthy human beings failed to reveal the possible organism though cultures of the blood were positive. On the other hand, the blood of uninoculated monkeys and rabbits contained them as also did cultures from these animals. It was noted that the animals in which they were found were running an irregular temperature. A case of subtertian malaria also revealed them. It was then discovered that if the defibrinated blood of a healthy person was kept in the water bath at 41° C. the same structures appeared in 2 to 3 hours. It was evident therefore that the spiral structures could not be regarded as an organism. One of the writers clinched the matter by submitting himself to inoculation with one of the apparently positive cultures. He remained well and none of the structures appeared in his blood. They were found in the blood in the stomach of Culex mosquitoes taken from dengue houses and in the mid-gut of *Aëdes* (*Stegomyia*) *aegypti* fed 21 hours before.

The structures at first mistaken for leptospira varied in length from 4–20 μ but usually measured 8–9 μ. They were brightly refringent when compared with other pseudo-spirochaetes or "erythrocyte streamers." They were fairly flexible, and a form of 8–9 μ in length would show 10–12 regular and symmetrical turns. They were actively motile with movements of forward and backward progression, and they would often dive down into the fluid and then come up again. Their most characteristic feature, however, was the invariable presence at either or both ends of what appeared to be a bead or spore larger than the diameter of the filament and more refractile. In the stained films they had a different appearance and in shape resembled the long Old English letter S. In an instructive plate reproduced here the authors figure what they call the puzzles and fallacies of dark-ground examination of the blood.

The authors describe these leptospira-like artifacts as novel, but they must be perfectly familiar to those who have examined rats for *L. icterohaemorrhagiae* or have worked with cultures of this organism, the movements of which are much more actively progressive and rotary than those of the filaments. Apparently the authors did not have cultures of true leptospira for purposes of comparison. Had these been available they would undoubtedly have been struck by the definite differences between true leptospira and the filaments.



A

Dark ground appearance of puzzles and fallacies in blood examination.—(After KNOWLES & DAS GUPTA, from *Indian Medical Gazette*.)

B

Dark ground appearance of a field containing *Leptospira icterohaemorrhagiae* from a culture in blood medium. (Original.)

(Both × 1000.)

Attention is called to the exhaustive investigation on dengue conducted by CHANDLER and RICE in America. These observers failed entirely to discover a leptospira in their cases (this *Bulletin* Vol. 20, p. 804). The mistake made by CHAMBERS (this *Bulletin* Vol. 2, p. 371) is also mentioned. This observer described as a new spirochaete in human blood the same filaments which gave rise to so much doubt in the present investigation, and the authors are inclined to agree with J. G. THOMSON that the leptospira discovered in cases of blackwater fever by BLANCHARD and LEFROU may be similar artifacts. It is to be hoped that at the present time, when so much interest is taken in leptospira, other workers before publishing their results will follow the authors of the paper in demanding convincing proof of the nature of any suspicious structures they find in blood.

C. M. Wenyon.

DE FARIA (J. Gomes). *Leptospira couvyi*, **chez un malade suspect de dengue.**—*C. R. Soc. Biol.* 1924. Jan. 18. Vol. 90. No. 1. pp. 55-56. [1 ref.]

A case of dengue was examined about two hours after the onset of symptoms. Blood films stained by Leishman stain showed four structures which the author considered to be leptospira. They were six to nine microns in length and all the four had one end or both ends hooked. They tended to be thicker in the middle than at the extremities, and the thickened portion was seen to be twisted in a very close spiral. The long axis was not straight but was bent two or three times in broad curves. The staining was very faint. Structurally therefore they correspond with leptospira, but it is unfortunate that no further proof by inoculation of animals, culture, or even observations on the fresh blood by dark ground illumination is put forward. The name *Leptospira couvyi* is given to the supposed organism. [In view of the paper by KNOWLES and GUPTA reviewed above, it will be well to keep an open mind regarding *Leptospira couvyi.*]

C. M. W.

MALARIA.

CHRISTOPHERS (S. R.). **Enquiry on Malaria, Blackwater Fever and Anchylostomiasis in Singhbhum. Report No. 1. Preliminary Investigation into the Conditions on the Bengal Iron Company's Mines at Manharpur, January, 1923.**—37 pp. With 6 maps and 4 figs. 1923. Patna: Supt. Govt. Printing, Bihar and Orissa.

The amount of material collected during this three weeks' inquiry in the cold non-malarial season is phenomenal and the matters of general interest considerable. The average haemoglobin was 10 per cent. less in those with palpable spleens than in those without. Spleen and parasite rates are treated both quantitatively and qualitatively. Qualitative measurement of the spleen rate in children is obtained by calculating the length of its exposed portion in centimetres as if it belonged to a child of six—with its average sitting-height of 60 cm.; of the parasite rate by spreading 10 cmm. of blood as a thick film on 2 square cm. of slide and examining 200 random fields [of undeterminable size] with the square aperture of the Ehrlich eyepiece. For ages 1–2, 3–5, 6–10, and 11–15, the spleen rates were characteristic of hyperendemic areas, namely, 73, 80, 71, and 46; when the spleen was palpable the average corrected palpable enlargements for these ages were 2·6, 4·5, 3·9 and 3·6 cm. Regarding the qualitative parasite index the number of rings per cmm. varied in 140 cases from 4 to 134,232, six-sevenths of the total number of parasites being harboured by those who by birth or immigration had dwelt in the place for 2 years or less.

ROSS and THOMSON (1910) found that 200 to 500 *Plasmodium vivax* and 600 to 1,500 *P. falciparum* per cmm. are required to cause a malarial attack. If this number be conservatively and conveniently raised to 5,000 it is calculated that each child below 2 would be under "attack" conditions for about half its life. Its probable after-history is indicated in the accompanying table:—

Age.	Spleen rate.	Parasite rate.	Average number of parasites per cmm.	Frequency of attack.
1 to 2 ..	75	100	12,629	**Almost continuous.**
3 to 5 ..	88	95	1,320	**Once in 25 days.**
6 to 12 ..	71	86	1,018	**Once a month.**
12 to 16 ..	46	50	198	**Once a month.**
Adult ..	11	50	122	**Once in 6 months**

It would seem then that the intense infection of infancy results in a considerable measure not merely of tolerance but of true immunity. The local measures advised to combat this local hyperendemism, with occasional blackwater fever, are wisely tentative.

Anaemia in the labourers is probably largely attributable to ankylostome infection. In 50 persons 0·02 gm. of whose stools was examined [evidently as a squash or smear] ova were not found in 36 per cent. They were estimated as under 100 per gm. in 14, 100 to 500 in 16, 500 to 1,000 in 10, 1,000 to 2,000 in 10, 2,000 to 5,000 in 2, and over 5,000 in 2 per cent.

The mere attempt to deal exactly with these various parasitic factors makes this valuable inquiry one which deserves wider publication and better editing than its present form implies.

Clayton Lane.

GILL (C. A.). **Malaria in the Punjab. The Malaria Forecast for the Year 1922.**—*Indian Jl. Med. Res.* 1923. Oct. Vol. 11. No. 2. pp. 661–666. With 1 map. [1 ref.]

The malaria forecast for 1922 (cf. also this *Bulletin*, Vol. 20, p. 555) made upon the rainfall of July and August with a view to estimating the malaria incidence of October and November was completed on September 15, the day on which the last rainfall figures were actually received. It anticipated in reasonable detail a somewhat featureless malarial distribution, probably a more difficult matter to forecast with any accuracy than one possessing more definite characteristics.

C. L.

CHALAM (B. S.), with Explanatory Note by YOUNG (T. C. McCombie). **Some Notes on a Malaria Investigation on a Sugar Estate in Kamrup, Assam.**—*Indian Med. Gaz.* 1923. Oct. Vol. 58. No. 10. pp. 476–479. [2 refs.]

The results of a two years' investigation are here described. The employees on these sugar estates, lying on open grass-land edged by swamp and stream, suffer severely from malaria, the splenic index of resident children being 82. Of all anopheles captured as adults in the rainy season *A. vagus* comprised 50·5, *A. listoni* 44·3 and, among others represented, *A. culicifacies* 1·2 per cent. It is concluded that one of the first two must, on account of their numbers, be the essential vector of malaria here, and since of 412 specimens of *A. vagus* dissected none was found infected, while of 315 *A. listoni* 3·8 per cent. exhibited sporozoits in their salivary glands, the latter is inferred to be implicated. It was next determined that the adults of *A. listoni* were present in proportion as houses lay near to swamp or stream, the spots indeed where the larvae were in the main found. Even in the dry weather *A. listoni* comprised 46 of 54 imagines captured. Since larvicidal measures in these places seem unlikely to prove useful palliatives, it is advised that habitations be removed to a distance from these localities.

C. L.

STRICKLAND (C.). **Malaria in Assam.** [Correspondence.]—*Indian Med. Gaz.* 1924. Jan. Vol. 59. No. 1. p. 62.

Anopheles umbrosus has been found in the Balipara Frontier Tract, Assam, where the splenic index is 100. The Assamese fauna, particularly Anopheline, follows closely the fauna of Malaya, where this mosquito is markedly noxious.

C. L.

CORNER (Wm.). **[The Type of Malaria in Iraq.]** [Correspondence.]—*Trans. Roy. Soc. Trop. Med. & Hyg.* 1923. Mar. 15 and May 17. Vol. 17. Nos. 1 & 2. p. 89.

In Kirkuk, a submontane spot in Northern Iraq, the splenic index in February and March 1923 was 60·5 and the parasitic index, presumably by simple smear, 47. Of the 213 malarial infections 150 were quartan, and the writer asks whether in any other district quartan malaria prevails to this extent.

[SDRODOWSKI and LINTDROP reported (this *Bulletin*, Vol. 19, p. 854) from Lenkoran, Azerbaijan, lying on the South-West Coast of the Caspian and within 350 miles of Kirkuk, local percentages of quartan malaria as high as 69·7 in July to September 1921. In December 1922 and January 1923 the percentage was only 43·2 (vide infra, p. 291). In Senegal high incidences have been recorded, that in Dakar being 42·6 per cent. (this *Bulletin*, Vol. 20, p. 292).]

C. L.

DE ROOK (H.). **Rapport omtrent malaria-onderzoek te Moeara-Tebo.** [Report on a Malaria Research at Moeara-Tebo (Djambi, Sumatra).]—*Geneesk. Tijdschr. v. Nederl.-Indië.* 1923. Vol. 63. No. 4. pp. 510–530. With 1 map.

This research became necessary to judge of the suitability of Moeara-Tebo as a military centre. Malaria (mostly tertian and subtertian) is endemic, but mild. *A. sinensis* was found to be the carrier; its natural infection index was 1·2 per cent.; no other species was found to be infected. The breeding places of *A. sinensis* in the vicinity of Moeara-Tebo were numerous (extensive swamps, drains, etc.), which makes sanitation very expensive and uneconomical. The author recommends quinine prophylaxis and suggests the use of buffaloes to attract the mosquitoes (SCHÜFFNER and HYLKEMA).

W. J. Bais.

HEYDON (G. A. M.). **Malaria at Rabaul.**—*Health.* Melbourne. 1923. Nov. Vol. 1. No. 9. pp. 249–254. With 4 text figs.; and *Med. Jl. Australia.* 1923. Dec. 15. Year 10. Vol. 2. No. 24. pp. 625–633. With 5 text figs.

The latter is the fuller of two papers dealing with the same material but using different illustrations. Lying close to the equator with little seasonal or diurnal range of temperature, this volcanic island (New Britain) has a porous soil with, on the inadequately drained coastal flats, a high level of subsoil water at once exposed by shallow excavations. The prevalent anopheles is *A. punctulatus*, of varieties *moluccensis* and "D." The latter occurs in temporary puddles such as hoofmarks; the former in more permanent collections of water often close to the sea and containing 1 part of salt in 7, and is probably the common variety in Rabaul. Of laboratory reared specimens, variety *moluccensis*, 7 out of 15 became infected from a *P. vivax* case, and 7 out of 7 from one infected with *P. falciparum*. Of a successful infection with *P. malariae* Heydon questions the validity.

Dissection of mosquitoes caught in native houses showed sporocyst and oocyst rates of at least 6·4 and 6·2 respectively; the total infection rate is not indicated. In 1,145 natives under 18 years the splenic index was 20; in 489 similarly aged the parasite index was 30. The relative spleen rates for different communities are considered. Parasites resembling the younger stages of *P. tenue* have not been rare; full grown and sexual stages have been absent. They are considered variations of *P. falciparum*. In one film from the Duke of York Islands forms resembling *P. vivax minutum* (this *Bulletin*, Vol. 4, p. 88) were noted.

C. L.

LESLIE (Percy C.). **Quartan Malaria.** [Case Report.]—*Canadian Med. Assoc. Jl.* 1923. Oct. Vol. 13. No. 10. pp. 752–753.

In Changteho (North Honan, China) quartan malaria appeared in the non-malarial season. Striking was the slightness of anaemia, and of splenic enlargement, fever and cachexia. Quinine gave early relief, but prolonged administration was necessary for cure, and parasites, whether sexual or asexual forms is unstated, might remain in the blood for many days.

C. L.

PADUA (R. G.) **Findings on the Malaria Investigation within the Four Selected Zones in Laguna Province.**—*Monthly Bull. Philippine Health Service.* 1923. Feb. Vol. 3. No. 2. pp. 47–66.

The results of an intensive campaign carried out in the Philippines from mid-May to mid-August, mainly with a view to obtaining malarial indices, upon 2,267 persons, inhabiting 387 houses, are detailed in 24 Tables. The parasite index based on thick and thin films taken from the lobe of the ear, presumably a pair from each person, was 7·94. The percentages of *Plasmodium vivax, P. malariae, P. falciparum* and of the last 2 combined, were respectively 70·88, 19·23, 5·49 and 4·4; the splenic index was 62·15; the haemoglobin index had no relationship to the incidence of detected malarial infection; no reference is made to the possible effects of kala azar or ankylostomiasis on these two indices. It is recommended that every case of fever should be notified to and followed up by the nearest local health officer, individual daily observation and treatment being contemplated. No estimate of the degree to which the Health Department would then need expansion, nor of the expense involved, is added.

C. L.

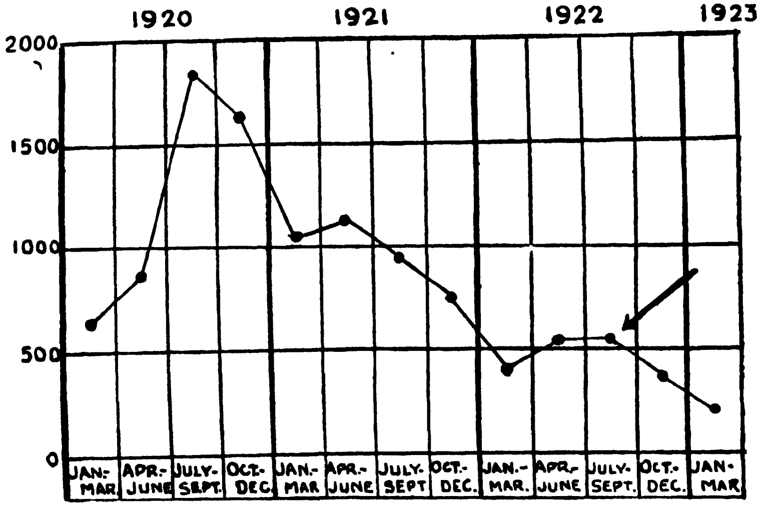
ALLEN (A. H.). **Report of an Antimalarial Campaign conducted by the Medical Officers of the First Brigade, United States Marines, in Haiti.**—*U.S. Nav. Med. Bull.* 1923. Oct. Vol. 19. No. 4. pp. 402–407. With 1 chart in text.

STORCH (R. B.). **The Malaria Parasite in Haiti.**—*Ibid.* pp. 407–409. [3 refs.]

—— **Personal Experiences with Malaria among Natives of the Republic of Haiti.**—*Ibid.* pp. 415–423.

The importance of malaria among marines in Haiti (this *Bulletin*, Vol. 20, pp. 563) is emphasized by the fact that in certain detachments the morbidity, presumably annual, was 400 per cent., and that the parasite index in apparently healthy natives was at least 50. In these circumstances attention is focussed on (1) the species of parasite concerned; (2) a quinine prophylactic campaign.

Acute and extraordinary doubt exists regarding the species of parasite implicated, but it is clearly not realized that, with infection so intense as it was, multiple infections must have been common and confusing. The clinical type appears to vary from frank tertian to haemoglobinuria. The quarterly incidence of malaria among marines is indicated in the accompanying chart, condensed from that of Allen, who claims that his results prove that it was possible to reduce malaria in marines in a highly malarious country by the administration of quinine—in the way described by Bass (this *Bulletin*, Vol. 18, p. 97)—to Haitians living within a mile of the marines' camp. It is, however, clear that the main reduction in malaria was antecedent to, and of course independent of, the administration of quinine to the neighbouring Haitians. Indeed, there is no convincing evidence offered that it had any hand in the continuation of the antecedent fall, brought about evidently by measures previously undertaken. Other points of interest are inability to determine the splenic index owing to the pot-bellied character of the population, the tolerance shown by the Haitians to the parasites, and their own conviction that mosquitoes and malaria are associated.



The quarterly malaria rate of the First Brigade U S.M.C., based on admissions per thousand per year (prepared from the author's chart, schematic). The arrow marks the point where the antimalarial campaign under consideration started, *i.e.*, September 1922.

C. L.

De Freitas (Lafayette) & Barretto (Castro). **A Lucta contra a Malaria no Districto Federal do Rio de Janeiro e zonas limitrophes.**—47 pp. With 11 figs., 5 charts and 2 folding maps. 1922. Rio de Janeiro: Litho-Typographia Fluminense 21, 22 & 24 rua da Quitanda.

The mortality from malaria in the Federal District of Brazil has fallen from 328·75 per 10,000 in 1872–1876 to 19·18 in 1917–1921. Among 339 found infected at Merity the specific percentages were with benign tertian malaria 87·31, with malignant tertian 11·2 and with quartan 1·47. In another series the average percentage of infected was 45. The assumption by malaria of epidemic proportions in 1919 and 1920 coincided with excessive rainfall. River valleys and estuaries are the parts most severely affected, but man-made malaria in connexion with railways, brickfields, wells and irrigation is a definite factor. Of the mosquitoes identified, *Cellia tarsimaculata*, *C. argyritarsis*, *C. albimana*, are held to be implicated in the spread of malaria. Treatment of acute conditions is by injections, whether intravenous or not is unstated, of 0·5 to 1·5 gm. of bihydrochloride of quinine, without ill effect. For the ordinary case 2 gm. is given daily for three consecutive days in three courses, two days separating the first and second course and three days the second and third. The preventive dose advised is 0·5 gm. daily or every other day. It is hoped to undertake the manufacture of quinine at the Oswaldo Cruz Institute. The extent of river rectification undertaken is nearly 300 miles, and much other reclamation work has been effected, striking photographs of which are given. The whole cost has been borne by the Brazilian Government.

C. L.

BREM (Walter V.). **Studies of Malaria in Panama. V. Pernicious Malaria.**—*Amer. Jl. Trop. Med.* 1923. Nov. Vol. 3. No. 6. pp. 517–527. [5 refs.]

Of 92 cases of malaria with pernicious symptoms 91 were infections with *Plasmodium falciparum* and 1 with *P. vivax.* The deaths numbered 41. The cases are divided into three overlapping classes of preponderating pathological phenomena: hyperinfection, cerebral thrombosis, and erythrolytic haemoglobinuria. Hyperinfection is held to occur if, when parasites are most numerous, that is to say, a few hours after the onset of the paroxysm, 6 per cent. of the erythrocytes be infected. Cerebral thrombosis is held established if there be stupor or coma with few parasites in the peripheral circulation; and erythrolytic haemoglobinuria by intense erythrocytolysis with no marked cerebral symptoms and few or no parasites demonstrable in the peripheral blood. There is, however, considerable overlapping, for of 22 cases of hyperinfection examined with that end in view 16 showed stupor or coma and 20 haemoglobinuria; so that the limit selected to indicate hyperinfection is probably that at which haemolysis becomes evident in the urine. Although he used 15 to 20 cc. of normal saline for his intravenous injections of quinine bihydrochloride, he believes that dilution should be to 100 cc. and 10 minutes occupied in the injection.

C. L.

CURRY (Dalferes P.). **Some Remaining Problems of Malaria Control on the Isthmus.**—*Proc. Med. Assoc. Isthm. Canal Zone.* 1920. Jan.-Dec. Vol. 13. Pts. 1 & 2. pp. 57–65. With 1 plate.

This paper deals with the year 1920. Its main general interest lies in the indication that any relaxation of vigilance in the Canal Zone means increased malarial incidence. Colon was at that time being annoyed by swarms of Anopheles attributable to a swamp two miles away, half of this distance being covered by open water.

C. L.

SERGENT (Edm.) & others. **Études sur le paludisme en Algérie 1922-23.**—*Arch. Inst. Pasteur d'Algérie.* 1923. Sept. Vol. 1. No. 3. pp. 261–583. With various plates & figs. [Refs.]

Note XXV. **De l'immunité-tolérance obtenue dans le paludisme des oiseaux par inoculation de sporozoites vivants.** [SERGENT (Et. & Edm.) & CATANEI.] pp. 264–269. With 1 chart. [3 refs.]

It is found that it takes the bodies of 3 mosquitoes "normally" infected with *Plasmodium relictum* of sparrows (sporozoits, whether contained in the salivary glands or dispersed over the body generally [this *Bulletin*, Vol. 18, p. 103] being injected) to produce severe infection in canaries. When the dose was reduced to two-thirds or three-quarters of the body of a single such mosquito severe illness followed in 5 cases, slight illness with subsequent immunity in 13, neither immunity nor illness in 7.

NOTE XXVI. **Suite des essais de traitement préventif ou curatif du paludisme par des produits autres que la quinine : Cinchonidine.** [SERGENT (Et. & Edm.) & CATANEI.] pp. 270-275. [1 ref.]

In canaries cinchonidine bihydrochloride appears somewhat less toxic than the similar salt of quinine. It has, however, no action on *Plasmodium relictum*, either preventive or curative, except in toxic doses, but it has a marked influence in reducing splenomegaly ; and its action in this respect in man is worth consideration.

NOTE XXVII. **Peut-on déterminer la dose infectante minimum de sang parasité** ? [SERGENT (Et. & Edm.).] pp. 276-278.

By determining the number of erythrocytes per cmm., the percentage of these found under the microscope to be infected, and the quantity of blood intraperitoneally injected, the number of *Plasmodium relictum* received by experimental canaries was calculated. In the instances cited it varied from 1,000 to 10,000, but the intensity of infection produced in the experimental birds had no relation to the number of parasites injected. In all cases the blood was drawn at the same stage in the life-history. The finding points, of course, to some degree of natural immunity.

SECTIONS VI to XXI, pp. 291-583.

Of Saharan anopheles the predominant species is *A. multicolor*, developing from egg to adult in 13 days in water often salter than the sea. Although never definitely implicated as a host of the human plasmodia its almost invariable presence in malarial oases indicates this to be the case. *A. sergentii*, *A. hispaniola* and *A. maculipennis* are also sparsely found.

Of 4,531 persons examined, mostly in the non-epidemic spring, the splenic index was 35·7, and the parasitic 10·7, the latter consisting of *P. falciparum* 2·1, *P. vivax* 4·6, *P. malariae* 1·8, and undetermined forms 2·1. The splenic index varies in different spots from 0 to 100, and, for the whole series, had the following age differences: up to 1 year, 13·7 ; from 1 to 5 years, 32·8 ; from 6 to 15 years, 39·8 ; over 15 years, 10·4. Regarding the amount of enlargement, this is measured in finger-breadths, without allowance for stature, so that it is naturally least in infants and greatest between 6 and 15. The parasite index also varied with locality, from 0 to 65, taken in the spring and based on a thin and a thick preparation. Comparing parasite and spleen rates, one child in three had a palpable spleen, and one in ten parasites detected, by the technique indicated, in the peripheral blood.

Breeding places are natural and artificial, temporary and permanent. Those in proximity to European dwellings are nearly all man-made. For quinine prophylaxis daily doses of from 5 to 40 cgm. (¾ to 6 grs.) are advised, according to age, swallowed in the presence of a trustworthy official. Of antilarval measures there are stressed the necessity that housing-sites shall in future be selected only after adequate investigation of their proximity to anopheline breeding places, and that facilities for irrigation shall be granted only under guarantees that such spots shall not be produced. The local conditions prevailing in Southern Algeria and in various cantonments are fully considered. Photographs from aeroplanes illustrate local topography and the extent to which antilarval operations have been undertaken. As a record on which future work will be built the study is invaluable. The malarial problem in Morocco is briefly considered.

C. L.

SDRODOWSKI (P.) & LINDTROP (H.). **Weitere Beobachtungen ueber Malaria in Aserbeidshan.** [Malaria in Azerbaijan. Further Observations.]—*Arch. f. Schiffs- u. Trop.-Hyg.* 1923. Nov. Vol. 27. No. 11. pp. 401-404.

These writers report further observations in December 1922 and January 1923 (this *Bulletin,* Vol. 19, p. 854).* The parasite index, based on one thick preparation, was 53·9, many of the infected having no symptoms. The splenic index was 76·8, and Ross's index 4·7. The percentages of malaria species present were *P. vivax* 18·1, *P. malariae* 43·2, *P. falciparum* 28·7, undetermined 10. The endemic index may reach 100.

C. L.

i. MACKENZIE (Melville D.). **Notes on the Epidemiology of Malaria in South-East Russia.**—*Lancet.* 1923. Dec. 8. pp. 1225-1227. With 3 charts.

ii. CHRISTIE (Ethel M.). **Malaria Clinics in Russia.** [Correspondence.]—*Ibid.* 1924. Jan. 26. pp. 204-205. [1 ref.]

i. The Senior Medical Officer, Friends' Russian Famine Relief Unit, S.E. Russia, reports that in 1921 half the inhabitants of BUZULUK OOYEZD, a district the size of Wales, died of starvation and typhus; thousands fled two thousand miles to Turkestan, where wheat was available. They returned after the harvest of 1922, bringing with them malaria, which in October of that year broke out in pandemic form all over south-east Russia, and steadily spread throughout the winter, with the thermometer standing at 20° to 30° below zero Centigrade, since Anopheles had become domesticated, breeding in the waterbutts within the huts, which were maintained, as is usual, at almost tropical temperatures. The terrifying effect of this new disease on the already debilitated population was such that they were prepared to accept any reasonable terms to escape it. This fear was used for their benefit.

The difficult factors involved were: an immense area; a famine which had destroyed almost all horses and half the population, and left the rest so weak that they could neither plough, collect food, look after their few animals, carry the rations issued by the Relief Unit, nor be reached by the few surviving doctors. Seeing that their bread was still diluted with grass their condition is scarcely to be wondered at. In wide distribution of quinine lay the only hope; but that available for private use was too little for adequate dosage, it was being frittered away by administration to non-malarious patients, and from hospitals it was being surreptitiously sold by attendants at a million roubles for five grains. The difficulties were overcome at the established clinics by not giving quinine unless malaria were microscopically established, by not accepting a case as negative unless no parasites were found after three examinations (each presumably by a single thin smear) during fever, and by making every case attend at a clinic and swallow every dose there. Administration was by one dose daily of 20 gr. of the bisulphate for a week, and thereafter 15 gr. on 2 days a week for 2 months. No course of treatment was begun without a promise that it would be completed, and so great was the dread engendered by this strange and devastating epidemic, combined with the knowledge that quinine would not be forthcoming in a future attack were this promise broken, that a long treatment was practically always administered. At the clinic in Buluzuk, town-educated Russians were trained for 3 months and then sent into the district, each in charge of a clinic of his own, run exactly on the lines indicated.

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* By a slip Lenkoram was there referred to as on the Western Caucasian shore. Azerbaijan Republic is on the Western Caspian shore, adjoining the Persian province of the same name.—C. L.

The percentage of positive blood examinations rose steadily from 50 in November, 1922, to 80 in May, 1923, but while the proportions of benign tertian, subtertian and quartan were at first 48, 36 and 16, at the end benign tertian comprised 98 per cent. of the whole. The writer adds :—

> " The effect of the epidemic on the future of Russia will probably prove to be greater than that of the Revolution. From a healthy country inhabited by a virile energetic peasant population and entirely non-malarial throughout its greater extent the whole of South Russia is now probably the most malarial country in the world." " It is probable that a great degeneration comparable with the effect of malaria on ancient Greece will in the next 20 years alter the type of the whole population of these Cossack districts and will threaten to overwhelm the rest of Russia."

The fascination of this picture lies in the heightened incidence of malaria at an out-door temperature of – 30° C., and in the far-reaching effects, hygienic, political and economic, which its pandemic incidence must have on the Russian nation ; consequences beyond the horizon of those who initiated the upheaval to which they are directly traceable.

ii. Dr. Christie refers to the Buzuluk clinic with 200 new patients a day, arriving behind horses, cows or camels from 50 miles round, their equipages blocking the street for 100 yards ; and yet there are those who have to be turned away. Gifts of money or quinine may be sent to the Friends' Council of International Service, 136, Bishopsgate, London, E.C. 2. Clearly the medical administration insures that every grain shall go its furthest.

C. L.

FABER (L. A.). **Bewerking van de gegevens der malaria-epidemie te Sloten in 1922.** [Details of the Malaria Epidemic at Sloten.]—*Nederl. Tijdschr. v. Geneesk.* 1923. July 7. 67th Year. 2nd Half. No. 1. pp. 9-20. With 1 fig. [8 refs.]

In 1921 there were under the author's care at Sloten, near Amsterdam, 203 cases of benign tertian malaria, or 5 per cent. of the population ; in 1922, 362 cases, or 9 per cent. In 1922, the monthly incidence was: 0(0)–2(1)–14(8)–38(27)–87(66)–595(82)–62(56)–31(28)–21(17)–10(9)–2(2)–0(0), the figures in brackets indicating the number of cases considered as primary. Apart from a relative infantile immunity, all ages were equally affected. All diagnoses rested on thick and thin films. In 28 persons who had suffered from malaria in the previous year, but had not taken quinine for at least 3 months, and were examined in April, 12 showed plasmodia in the peripheral circulation, and 5 relapsed; in 16 the blood examination proved negative and 7 relapsed.

In one case of parasitic without clinical relapse, schizonts numbered 35 per 15 leucocytes, and two days later gametocytes were also found. In children of 8 to 14, taking daily 0·75 gm. (12 grs.) of quinine sulphate, parasites (in one case schizonts are specified) disappeared from thin films in 1 to 2 days, from thick preparations in 6 to 7 days. No correlation was detected between the duration of the illness and the finding of gametocytes. They were present after the second as frequently as after several attacks or as in relapses.

Splenic enlargement, particularly affecting children, occurred in 9 of 30 cases after one attack, in 55 of 112 after two attacks, and in 32 of 41 after three or more attacks. It quickly disappeared under quinine.

More than half of the cases relapsed after treatment equally whether long continued with large doses, 2 grams a day for three weeks as THOMSON advocated, or for shorter periods with ordinary doses. The author suggests that quinine in solution might prove more beneficial than in the tablet form.

N. H. Swellengrebel.

SENEVET (G.). **Le paludisme dans la Double (Dordogne).**—*Arch. Inst. Pasteur d'Algérie.* 1923. Dec. Vol. 1. No. 4. pp. 604–606.

The shrinkage of malaria in the Double has coincided with a lessening of anopheles breeding-places, due to an extensive, though not complete, draining of marsh land; to extended use of quinine; and, above all, to a raised standard of living, as witness the fact that the wife is no longer yolked with the family ass to help drag a primitive plough.

C. L.

MAXCY (K. F.) & COOGLE (C. P.). **The Spleen Rate of School Boys in the Mississippi Delta.**—*Public Health Rep.* 1923. Oct. 26. Vol. 38. No. 43. pp. 2466–2472. [7 refs.]

Malarial investigations in the Mississippi Valley (this *Bulletin*, Vol. 20, p. 963) have now been extended to the delta. Schoolboys were examined in the winter; the spleen was deemed enlarged only if palpable beyond dispute; the parasite index was based on a thin and a thick preparation. It is urged as acceptable that a spleen rate of over 1 per cent. is indicative of malaria, that infection is markedly focal and that such a focus should be investigated if the rate, over a considerable number of investigations, exceed three or four.

Of 531 examined, 135 were positive either to blood or spleen examination, the blood detecting 40 and the spleen 108; so that the splenic index was higher than, and hygienically as valuable as, the blood. The splenic index was higher in coloured than in white boys.

C. L.

BOYD (Mark F.). **A Report to the Missouri State Board of Health on the Incidence of Malaria in South-East Missouri.**—*Rockefeller Foundation, International Health Board.* Publication No. 7603. 47 pp. With 1 graph. 1922. May. New York City.

When investigation of this problem was undertaken, a representative strip of land 24 miles long from East to West by 12 wide from North to South was chosen, of which BOYD, of the International Health Board, investigated the northern half, and ZIEGLER, of the U.S. Public Health Service, the southern. The latter's work has been considered in this *Bulletin* (Vol. 20, p. 963). Boyd's, undertaken at the same time, forms a valuable independent confirmation of the results already abstracted.

C. L.

GILL (C. A.). **The Relation of Malaria to Altitude.**—*Indian Jl. Med. Res.* 1923. Oct. Vol. 11. No. 2. pp. 511-542. With 2 charts. [20 refs.]

Gill considers the relation between his own observations on the correlation between malaria and humidity (this *Bulletin*, Vol. 17, 293–4; 18, p. 328), and the generally accepted observation that there is no danger of acquiring malaria in the Himalayas at altitudes of over 7,000 ft. He shows that at Murree, at an altitude of 7,500 ft., the malaria carriers *Anopheles willmori* James and *A. plumbeus* Haliday are common from May to August; that heavy gametocyte-carriers of *Plasmodium vivax* are readily to be obtained in the station; that there exists for about 8 weeks of the year, round about August, that combination of a mean temperature of at least 61° F., with a humidity of at least 63 per cent., whose combined continuance for at least 14 days he has shown in India and England to be essential for the appearance of malaria; that *A. willmori*, kept at temperatures between 20° and 22·2° C. (68° and 72° F.), will develop oocysts and sporozoits, the latter in 14 days or more; and that infection is then actually conveyed by its bite. His conclusion that malaria can naturally be acquired in Murree must, however, be contingent upon whether the daily natural range of temperature there remains within these narrow limits. If the diurnal range be greater, as one's experience in other Indian hill stations suggests is the case, conclusions as to natural anopheline development of benign tertian parasites would hardly hold.

Gill's tentative suggestions regarding the causation of malarial relapse are opportune and illuminating. He quotes the work of ACTON and his collaborators (this *Bulletin*, Vol. 18, p. 335) indicative of a selective action by quinine on the schizonts of *P. falciparum* which allows *P. vivax* to survive and to relapse, points out that in Muscat he found relapses to be due almost entirely to *P. falciparum*, and suggests that environmental conditions associated with high altitude may be particularly conducive of relapse in benign tertian malaria. In other words, his warning must imply that the quinine theory (*l.c.* Vol. 19, p. 277), explanatory of the seasonal variations of the different parasites of malaria, does not cover the whole matter, and that there really are climatic influences which determine the survivals and recrudescences of malarial parasites while they inhabit man. The filling of the gaps in our knowledge on this matter would be of the greatest value.

C. L.

DAS (Sundari Mohan). **Malaria and Abortion.**—*Calcutta Med. Jl.* 1923. Aug. Vol. 18. No. 2. pp. 348-352.

It is estimated that by abortion the potential population of Bengal is lessened by 800,000 annually, and it is judged, by experience of 185 cases, that 37-8 per cent. of these abortions are caused by malaria. Eleven illustrative cases are given in none of which is there any mention of blood examination. The author considers that quinine intramuscularly is wonderfully tolerated, and he has never met a case in which it acted as an "oxytocic." The other chief conditions to which abortion is attributed are syphilis, endometritis and early conception, and the criminal indifference of husbands to the results of their premature marital relations is the subject of severe comment. Dr. STOPES' aid has not apparently been sought. The possible abortifaciet effects of hook-worms, indicated by STILES in 1911, are unnoted in spite of the heavy incidence of that infection which plagues Bengal.

C. L.

DI PACE (Ignazio). **A proposito dell' urobilinuria nella diagnosi della malaria latent.**—*Policlinico.* Sez. Prat. 1923. July 9. Vol. 30. No. 28. pp. 893-897. [8 refs.]

Being sceptical as to expressed opinion that urobilin in the urine is a satisfactory indication of malaria, di Pace has investigated the matter in 181 cases. Its presence was constant when parasites were found in the blood and clinical evidences of malaria were present, frequent where there had been an acute attack within two or three months and parasites were still detectable in the peripheral blood, rare where the last attack was more than four months previous and where parasites were only found if they had been driven into the peripheral blood by an injection of strychnine, exceptional in asymptomatic latent malaria. It is not then likely to help a diagnosis in those cases where help is required. Some of the reactions were very slight and the test requires, as far as possible, exclusion of light and air.

C. L.

MCALISTER (W.). **The Treatment of General Paralysis by Infection with Malaria.** *Brit. Med. Jl.* 1923. Oct. 20. pp. 696-698.

GRANT (A. R.). **The Treatment of General Paralysis by Malaria.** *Ibid.* pp. 698-700. [9 refs.]

Cases of deliberately inoculated malaria are now reported from Britain. McAlister obtained his infection from one who had acquired benign tertian malaria in Burma, and at the height of a paroxysm enough blood was taken to inject at once 2 cc. subcutaneously into each of 12 paralytics. All became infected, after incubation periods varying from 8 to 32 days, diagnosis being by the microscope. Quinine hydrochloride, 10 grains every four hours for three days, and thereafter 5 gr. three times a day for 14 days, were given after about twelve paroxysms had shown themselves, and 0·3 gm. of novarsenobenzol weekly for six weeks. No clinical relapses occurred.

Grant injected subcutaneously into 40 patients 2 cc. of blood from one of four sources, a quartan, a subtertian and two benign tertian. One of the last sources, obtained originally from and first injected by STEPHENS, was the only one persisted in. It had been brought from Liverpool to Whittingham in a thermos flask, two and a-half hours elapsing between its being drawn and re-injected. Thereafter infection was continued by subcutaneous injection of 2 cc. of blood from patient to patient drawn indifferently during or between paroxysms. This strain has passed through 15 hosts and seems to be increasing in virulence since temperatures rule higher than they did a year ago. One case has spontaneously recovered from his malaria. The others have been treated with quinine sulphate, in all cases without clinical relapse, 2 gm. daily for 3 days proving as effective as a total of 48 gm. This curious lack of relapse, so prominent a feature of these inoculated benign tertian infections, is attributed either to some condition present in paralytics, or to failure of passage through the mosquito, though the latter, one would imagine, could hardly have such an immediate effect.

C. L.

WORSTER-DROUGHT (Cecil) & BECCLE (H. C.). **The Treatment of General Paralysis of the Insane by Malarial Infection. (Preliminary Note.)**—*Brit. Med. Jl.* Dec. 29. pp. 1256–1257. [8 refs.]

The strain of benign tertian malaria used was obtained by Low's courtesy from the Seamen's Hospital, Endsleigh Gardens, London. Infection was carried on by the subcutaneous injection of 2 cc. of blood, drawn at any period, febrile or afebrile. After 12 attacks the infection was treated by one or two intramuscular injections of 15 grains of quinine bihydrochloride, followed by seven days' oral administration of 5 grains of quinine sulphate daily. No clinical relapses have occurred.

C. L.

PLEHN. **Die Malariabehandlung der progressiven Paralyse.**—*Deut. Med. Woch.* 1924. Feb. 1. Vol. 50. No. 5. pp. 136–138. [15 refs.]

For the 41 paralytics here reported as deliberately infected with malaria three sources were used: (1) a subtertian infection which resulted in one direct death from cerebral malaria; (2) a frank tertian infection from Hungary; (3) a strain from Palestine with quotidian fever and no gametocytes, upon whose specific position the writer does not commit himself. Treatment was by intramuscular injection of bihydrochloride of quinine, 1 gm. on 2 consecutive days; on the third day after, 0·5 gm.; the same quantity being repeated two or three times at intervals of four days. No clinical relapses occurred, and among the seven who died the only instance in which search revealed any parasite in any organ was that above mentioned in which death followed coma. The dose of quinine which apparently produced complete disinfestation for both tertian and subtertian malaria was accordingly in this series 7½ to 10 gm. of the bihydrochloride.

C. L.

ROSS (Ronald). **Notes on the Inoculation of Malaria.** [Correspondence.]—*Brit. Med. Jl.* 1924. Jan. 19. p. 130. [4 refs.]

In view of the number of malaria inoculations now being made in the treatment of general paralysis, Ross urges investigation on the following points: (1) Is it the case in human malaria, as BEN-HAREL (this *Bulletin*, Vol. 21, p. 138) has shown for bird malaria, that the erythrocytes begin to fall in numbers within 24 hours after infection and long before parasites are detectable in the circulating blood?; (2) Could not more exact figures regarding the number of asexual parasites injected be given, so that the factor of individual resistance may be determined?; (3) Is there really absence of parasitic relapse in these inoculation cases, as the records imply?

C. L.

HERZIG (Ernst). **Zur Malariabehandlung der P.p.**—*Wien. Klin. Woch.* 1924. Jan. 24. Vol. 37. No. 4. pp. 88–89.

The kind of malaria used in these cases seems nowhere stated. In one case a temperature of 43° C. (109 4° F.) was induced, fortunately without harm.

C. L.

SILVESTRI (Silvestro). **Assorbimento, eliminazione, tossicità della cinconina.** [The Absorption, Excretion and Toxicity of Cinchonine.]—*Policlinico.* Sez. Med. 1923. Dec. 1. Vol. 30. No. 12. pp. 601–610. [9 refs.]

Rabbits were intragluteally injected with 200 mgm. of alkaloidal bihydrochloride, three with quinine and three with cinchonine; one from each series was killed after 12, 24 and 72 hours; and the number of mgm. of salt recovered (*a*) from the site of injection, (*b*) from the viscera, was determined in each instance. They were as follows:—

Hours after injection.	Recovered from site of injection.		Recovered from viscera.	
	Quinine.	Cinchonine.	Quinine.	Cinchonine.
12	80	40	30	88
24	65	30	26	65
72	28	10	8	2

Clearly cinchonine entered the circulation more rapidly than did quinine; moreover, it gave rise to no local necrosis. Further, with oral administration Tanret's reaction gave in the first 24 hours a much more marked urinary turbidity with cinchonine than with quinine; so that administered by either route cinchonine is more rapidly absorbed than quinine. It has also been tolerated where quinine has apparently produced toxicity (this *Bulletin*, Vol. 21, p. 93).

C. L.

MANOUKHIN (Ivan I.). **The "Self-Defensive Reaction" in the Treatment of Malaria.**—*Lancet.* 1924. Jan. 26. pp. 170–174. With 4 figs. [53 refs.]

On grounds far from fully covered by this paper Manoukhin concludes that all infections, malaria among them, are accompanied by a primary and a secondary hypoleucocytosis divided by a hyperleucocytosis, the last being ended by means of a leucocytolysis, the phenomenon which he designates as a "self defensive reaction." Malaria he treats by X-radiation of the spleen, filtered through 1 mm. of aluminium, in a dose equal to 1 h. (Holzknecht unit), of duration five minutes daily, at 1 milliampère, of hardness 8, at 25 cm. from the surface of the body. The liver must be entirely shielded since its action is held antagonistic to that of the spleen, the action of the rays on the latter activating its leucocytolytic action. The good effects do not usually appear for 8 or 10 days. He has had no deaths and no relapses, comments on the good condition of his patients, and, considers that the disease is by this treatment shortened to one-third. He contrasts his results with those of a neighbouring hospital giving quinine, to the marked detriment of the latter; but he has not dealt with the consideration that "quinine" which usually takes thrice eight days to cut short malaria is not really quinine.

C. L.

DE FREITAS (Q. B.). **Quinine per Rectum in the Child.** [Correspondence.]—*Jl. Trop. Med. & Hyg.* 1923. Nov. 15. Vol. 26. No. 22. p. 348.

A 20 years' use of quinine rectally in British Guiana convinces de Freitas that but for this method promptly used many infants there would die of malaria. He has never seen any of the sequelae mentioned by FLETCHER (this *Bulletin*, Vol. 20, p. 970), and agrees with each of NEWHAM'S statements (*loc. cit.*). He uses the ordinary acid solution of sulphate of quinine, 10 grains in an ounce with 20 grains of bromide of potassium, and gives an infant 6 to 8 drachms.

C. L.

KLIGLER (I. J.) & WEITZMANN (I.) **Malaria Control Demonstrations in Palestine. Report on Malaria Control Demonstrations of the Hadassah Medical Organisation.**—75 pp. With 6 figs., 1 map and 2 charts. 1922. Jerusalem: Printed by the Jerusalem Printing Works, Ltd.

Features of more general interest are the extent to which, in the areas investigated on the shores of the Sea of Galilee, malaria was man-made by careless irrigation and insufficient treatment. A curious natural feature is that described as a "gravel swamp," a layer of exposed gravel, lying evidently on some impermeable stratum, over which water trickles. The layer of gravel is deep enough for the upper stones to overlie the water, but beneath them Anopheles breeds freely. The condition seems unlikely to be bettered without considerable engineering. The anti-larval measure found most useful was a mixture of one part of crude oil and four of petroleum, which gave a uniform tenacious film five times the area of a 1 in 9 mixture. If 0·1 per cent. of castor oil were also added the area of the film was further doubled. A 1 per cent. cresol mixture in water was more effective in the gravel swamp than was oil-paraffin, but cresol, if added elsewhere to the latter appeared to prolong the film's existence. It is concluded that in Palestine a large measure of malarial control can be obtained at a cost of less than P.T. 50 for the first year.

Old terms are employed with new and unemphasized meanings. The word "carrier" is used in one place of any one with a recent history of malaria, or with a soft and enlarged spleen, or again with parasites detected presumably in a thin smear of peripheral blood. Elsewhere, for "recent malaria" as a sufficient designation for a carrier is substituted "chronic malaria." In a third spot it is stated that 25 per cent. of the Jewish and 50 of the Arab population suffered from chronic malaria and that 4 per cent. or more are active parasite carriers, where the term is presumably used in the accepted sense.

This supplement to the Report for the year 1920–21 has only just been made available, and it seems likely that the very evident lack of proof reading, responsible for these inconsistencies and for a number of detected and undetected printer's errors, may be no fault of the writers. Finally, it is necessary to note that they attribute to the Sectional Editor certain conclusions and suggestions which WENYON's ripe experience originated, and that they have clearly found the pages of this *Bulletin* to be of marked value.

C. L.

KLIGLER (I. J.). **Quinine Prophylaxis and Latent Malaria Infection.**—*Trans. Roy. Soc. Trop. Med. & Hyg.* 1923. Oct. 18. Vol. 17. No. 4. pp. 259–262.

In Athlit in July, 1922, 80 men lost 315 days' work from malaria. Regular quinine administration of 2 gm. (30 gr.) daily for five days, and thereafter 10 gr. daily until November, produced the result that in that month 200 men lost 125 days' work from that infection. In December quinine administration was stopped, and of 112 men examined four days later parasites were found in just over a quarter. Quinine had kept these men at work, but had masked infections so that 30 of them on stopping quinine would have become foci of infection.

Similarly, to 12 children at Ein Harod a conscientious nurse administered quinine daily during the malarial season, and only two suffered from malaria. On stopping quinine 11 of the 12 fell ill with malaria within three weeks, parasites being, however, most difficult to detect. There was no corresponding illness among adults. It is held that the commercial possibilities of this induced latency are overweighed by its hygienic potentialities for ill.

C. L.

RICCI (Omero). **Relazione medica sulla Campagna antimalarica nella "Zona della Valle dell' Inferno."**—*Policlinico.* Sez. Prat. 1924. Jan. 28. Vol. 31. No. 4. pp. 122–123.

The Vale of Hell in 1923 housed 1,189 souls, 937 being permanent denizens, 252 making but a temporary sojourn. Three-quarters of them were racked by malaria—judging by blood examination of 16—and 30 per cent. experienced malarial relapse. They consumed, in the period, over 15 kgm. of quinine. It is urged that it needs but persistence in the good works of hygiene to uplift, as its neighbours have been raised, this mephitic suburb of Rome, studded as it is with water pools made by man and nature.

C. L.

FONTOYNONT. **Prophylaxis biologique du paludisme et des infections intestinales.**—*Congrès de la Santé Publique et de la Prévoyance Sociale, Marseille, 11–17 Septembre, 1922. Comptes Rendus.* pp. 353–354.

The biological prophylaxis of malaria, through war against anopheles larvae by fish, is not here under consideration. It is noted that two spiders *Nephile madagascariensis* and *Epeira-levista* [sic] have been deemed to be of value against imagines. The former, for instance, was required in 1904 for experiments for weaving its web into silk, and 300,000 of them were destroyed in three months. It is judged that at a conservative estimate these would have destroyed 3,000,000 mosquitoes, and a coincident rise in malaria is attributed to the latter's survival. Another spider is held to be specially destructive of *Lucilia caesar*, and so to be inhibitive of dysentery, while the first has been imported into the Congo in the hope that it will decimate the tsetse fly.

C. L.

MACGREGOR (Malcolm E.). **The Development of Modern Anti-Malaria Campaigns.**—*Lancet.* 1924. Jan. 5. pp. 24–25.

At the end of a definitely worded paper the writer's views are thus expressed :—

"Since it may be said that the foundation of economic and modern anti-malaria campaigns lies in the adoption of direct and permanent measures against only the proved breeding places of the definitely incriminated vectors, and the avoidance of all measures that are merely palliative or which aim at dealing in any locality with the anophelinae in general, it follows that the command of such campaigns must, in future, rest with the chief entomologist and his staff."

C. L.

RAND (R. F.) ; STANNUS (H. S.). **Prophylaxis of Malaria and Blackwater Fever.** [Correspondence.]—*Brit. Med. Jl.* 1924. Jan. 12. pp. 85–86 ; Jan. 26. p. 172.

Is the prophylactic value of quinine the result of distaste on the mosquito's part for bitter blood ? If so, why not substitute the the cheaper aloes ? The path for black water fever is laid by malaria, it occurs in those who may fitly be described as malarial cachectics, and the liability to it can be lessened by the regular use of gelatin, by iron and arsenic, by the antiscorbutics—milk, citrous fruits, fresh meat and fresh vegetable, especially the bamia and egg fruit, and by avoidance of extremes of weather, fatigue and worry.

Stannus points to the absence of scientific proof of the statements made above, some indeed being incorrect.

C. L.

CHAMBERS (J. H.). **The Complement Fixation Test and other Findings in Malaria.**—*U.S. Nav. Med. Bull.* 1923. Nov. Vol. 19. No. 5. pp. 661–667: [15 refs.] and *Amer. Jl. Trop. Med.* 1923. Nov. Vol. 3. No. 6. pp. 509–516. [15 refs.]

The conclusion reached, based on work done in connexion with the artificial production of benign tertian malaria, is that active malaria may on rare occasions produce partial inhibition of haemolysis in serum obtained during active schizogony, and accordingly that no attempt should be made to diagnose syphilis by complement-fixation so long as malaria parasites are recognisable in the cutaneous blood.

C. L.

GOODMAN (Neville M.). **A Case of Malaria arising in this Country.**—*Brit. Med. Jl.* 1923. Dec. 22. p. 1205. [4 refs.]

In 1923, ten days after leaving a Girl Guides' camp at Pitsea, Essex, a girl of 12 developed benign tertian malaria. A farmer at the nearest habitation, half-a-mile from the camp, had acquired malaria locally 30 years ago, at which time, he said, every one on the marsh land had ague; examination of his blood revealed no parasites. The girl's father, whose blood was not examined, living in the East End of London, had had "sandfly fever" in Gaza in 1917, and a similar attack in France in 1918. It is concluded that there is an endemic malarial focus at Pitsea.

C. L.

MARINESCO (G.) & DRAGANESCU (State). **L'influence nocive du néosalvarsan sur les sujets atteints de syphilis et de malaria. (Contribution à l'étude des lésions histologiques des centres nerveux dans la malaria comateuse.)**—*Bull. Acad. Med.* 1923. Dec. 18. Year 87. Vol. 90. 3rd Ser. No. 43. pp. 598–602. [6 refs.]

Neosalvarsan given to a general paralytic lighted up a fatal subtertian malaria. The brain, besides the usual haemorrhages, contained microscopic nodular spherical lesions. Surrounding an obstructed capillary with homogenous walls lay, in order, a layer of necrotic tissue, a zone of neuroglial elements, and a circlet of extravasated blood.

C. L.

i. ARMSTRONG (John S.). **Notes on a Case of Ascariasis simulating Malarial Fever.**—*Trans. Roy. Soc. Trop. Med. & Hyg.* 1923. Mar. 15 & May 17. Vol. 17. Nos. 1 & 2. pp. 49–50 With 1 chart.

ii. FONTOYNONT. **Les lesions vasculaires dans le paludisme.**—*Congrès de la Santé Publique et de la Prévoyance Sociale, Marseille, 11–17 Septembre, 1922. Comptes Rendus.* pp. 221–224.

ROUSSY. **Classification des psychoses paludéennes.**—*Ibid.* pp. 224–228. [17 refs.]

iii. HOFFMANN (W. H.). **La infiltración calcerea vascular de Duerck en la encefalitis létargica y la malaria tropica.**—*San. y Benefic. Bol. Ofic.* 1922. Vol. 27. Nos. 9, 10, 11 & 12. pp. 486–488.

iv. GUIMARÃES (Aristides Galvão). **Formula de Armstrong no paludismo.**—*Bol. Soc. Med. e Cirurg. de S. Paulo.* Brazil. 1922. Dec. & 1923. Jan.-Feb. Vol. 5. 3rd Ser. Nos. 10, 11 & 12. pp. 206–208.

v. GORDON (R. M). **The Urine in Malaria.** [Miscellanea.]—*Ann. Trop. Med. & Parasit.* 1923. Dec. 21. Vol. 17. No. 4. p. 556.

vi. LEVY (Moise D.). **Malarial Nephritis.**—*Southern Med. Jl.* 1923. Dec. Vol. 16. No. 12. pp. 942–944. [3 refs.]

vii. SABRAZÈS. **Quelques syndromes et séquelles du système nerveux central dans le paludisme.**—*Gaz. hebd. des Sciences Méd.* 1923. Oct. 21 & 28. Vol. 44. Nos. 42 & 43. pp. 526–540.

viii. ETIENNE (G.) & BENECH (J.). **Diabète grave au cours du paludisme prolongé.**—*Bull. et Mem. Soc. Méd. Hôpit. de Paris.* 1924. Jan. 24. Year 40. 3rd Ser. Vol. 48. No. 2. pp. 59–61.

i. Short high paroxysms of a double quartan type disappeared after the passage of 4 female ascarids. Ova, whether fertile or unfertile is not stated, were detected in the faeces together with trichuris ova.

ii. In neither paper is any evidence offered that the disabilities described were caused by, and were not mere concomitants of, malaria.

iii. Hoffmann draws attention to Duerck's findings in encephalitis lethargica and subtertian malaria (this *Bulletin*, Vol. 17, p. 298) in which, it now appears, dark ground illumination shows that calcareous deposits rapidly appear in the outer and middle coats of small vessels of the basal ganglia, medulla and cerebellum, spreading to the intima and causing vascular constriction and occlusion.

iv. In a woman in whom no parasites were found but who was clinically malaria and who reacted rapidly to quinine the mononuclears, larger than a polynuclear leucocyte, gave percentages in three slides of 20, 22, and 18, the first before quinine was given, the others after.

v. Of 16 cases of malaria 10 showed albumin, casts, or renal epithelium, 1 out of 1 being infection with *Plasmodium malariae*, 2 out of 2 with *P. vivax*, and 7 out of 13 with *P. falciparum*.

vi. Three cases are cited of subtertian malaria with albuminuria, casts and anasarca. In no case did the condition completely clear up, although marked improvement set in with treatment; and in no case is evidence offered as to the antecedent urinary condition.

vii. There appears to be nothing in these cases not familiar to practitioners in the tropics.

viii. A man acquired malaria in Salonica in 1917. Parasites were still present in 1919, but no later note of their detection is to be found. In 1922 he had a sharp disturbance of unstated character, and seven days later evidences of diabetes first showed themselves. No evidence of its association with the presence of parasites or of its amelioration under antimalarial treatment is offered.

C. L.

i. Autric. **Réactions des paludéens sous l'influence de la quinine.**—*Congrès de la Santé Publique et de la Prévoyance Sociale, Marseille, 11–17 Septembre, 1922. Comptes Rendus.* pp. 214 220.

ii. Dixson (T. Storie). **The Treatment of Chronic Malaria.**—*Brit. Med. Jl.* 1923. June 30. pp. 1087–1088. With 1 fig. [4 refs,]

iii. Brandão (Aureliano). **O 914 e a malaria.**—*Brazil-Medico.* 1923. Oct. 20. Year 37. Vol. 2. No. 16. p. 243.

iv. Morris (Leslie M.). **Naval Medical History of the War, Section of Tropical and Sub-Tropical Medicine. Part I. (ii) Malaria in the Eastern Mediterranean. With Special Reference to its Prevention under the Conditions of Active Service.**—*Jl. Roy. Nav. Med. Serv.* 1923. Apr. & July. Vol. 9. Nos. 2 & 3. pp. 137–144; 186–190. With 5 text figs.

v. Watson (Malcolm). **The Control of Malaria. A Tribute to the Genius of Sir Ronald Ross on the Twenty-fifth Anniversary of his Great Discovery.**—*Jl. Trop. Med. & Hyg.* 1924. Jan. 1. Vol. 27. No. 1. pp. 6–7.

i. In discussing this paper Le Dantec says that its title might fitly be "Paradoxical Effects of Quinine," points out the almost complete absence of microscopic control in the seven cases mentioned, notes that one of the three fatal cases had dysentery and probably excess of emetine, and that the two others received at a dose 3 gm. (45 gr.) of quinine, which he characterises as brutal therapy.

ii. The treatment advocated is 18 gr. of quinine hydrochloride daily, in doses of 3 or 4 gr., as a pill, an hour or more before a meal and at bedtime, taking at the same time 3 or 4 ozs. of water, and continuing thus for two months. No figures of results attained are given, but these are held to be good.

iii. Neosalvarsan in doses not exceeding 0·3 gm. combined with quinine have given results in chronic malaria which are described as magnificent.

iv. The essentials of an antilarval campaign in the terrain under consideration are detailed.

v. The subheading is emphasized by instancing the heavy jolt given to the hold of malaria upon Carey Island and Singapore by Ross's discoveries which, it is estimated, have in Malaya alone saved 100,000 lives.

C. L.

DELGADO (Honorio F.). **Treatment of Paresis by Inoculation with Malaria.**—*Jl. Nervous & Mental Dis.* 1922. May. Vol. 55. No. 5. pp. 376–389.

KRASSNIG (Max). **Der Einfluss der Malariatherapie auf die metaluetischen Störungen des Akustikus.**—*Med. Klin.* 1924. Jan. 6. Vol. 20. No. 1. pp. 7–9.

SCRIPTURE (E. W.). **The Treatment of General Paralysis by Malaria; The Use of Speech Inscriptions for Early Diagnosis.**—*Jl. Mental Sci.* 1923. Jan. Vol. 69. No. 284. pp. 77–83. With 2 figs. [7 refs.]

TEMPLETON (W. L.). **The Treatment of General Paralysis by Malaria.**—*Brit. Med. Jl.* 1923. May 26. No. 3256. pp. 895–896. [5 refs.]

MISCELLANEOUS.

BOMBAY. **Report of the Bombay Bacteriological Laboratory for the Year 1922.** [MACKIE (F. P.). Offg. Director.]—15 pp., with 1 chart. 1923. Bombay: Part II. Government Central Press. [Price, Re. 0-4-6.]

Antirabic treatment at this laboratory dates from April, 1922. The vaccine adopted is the carbolized fixed virus introduced by SEMPLE; it is bottled in ampoules containing 5cc. and 25cc. respectively and is stored in a refrigerator. Centres for treatment were opened at five places in the Province. 429 cases were treated at the laboratory, of which 60 per cent. were bitten in Bombay City. 175 other cases were advised that treatment was unnecessary, being 25·9 per cent. of persons presenting themselves. At the branch centres 246 were treated.

Research work done by Hamilton FAIRLEY and Glen LISTON showed that three different agents were responsible for the manifestations of dracontiasis; the guinea worm produced the early systemic symptoms, such as urticaria, the embryos caused a sterile subacute abscess, and bacterial infection was responsible for the serious symptoms, cellulitis and the like. Antibody could never be demonstrated by the Bordet-Gengou reaction, nor did the injection of extracts of the worm lead to its elaboration. The observations of MACFIE on the efficacy of tartar emetic treatment were not confirmed.

Owing to the danger of human bilharziasis becoming endemic in India introduced cases have been treated with tartar emetic with a view to eradication of the infection. The use of a specific serological reaction in 25 cases suggests a doubt whether clinical cure is real cure. Sixty goats were experimentally infected with *S. spindalis*; tartar emetic was found to exert a definite lethal effect on a majority of the schistosomes, but only exceptionally was complete cure established in heavily infested goats. Living ova were demonstrated in the intestinal mucosa after prolonged treatment, when the faeces were negative for ova.

Dr. S. N. GORE has devised a simple method for the examination of water, based on the detection of indole-producing bacteria.

A. G. B.

CALCUTTA. **Report of the Pathological Laboratory of the Medical College Hospitals, Calcutta, for the Year 1922.** [SHANKS (G.), I.M.S., Professor of Pathology and Bacteriologist to the Govt. of Bengal.]—15 pp.

In this Laboratory in 1922 6,396 examinations were carried out, but only 51 autopsies, in cases where the bodies were not claimed. In the course of routine blood cultures in febrile cases two *B. pestis* infections were discovered; clinically there was no suspicion of plague. It having been ascertained in 1921 that all suspected kala azars that were positive in the formalin test showed leishmania in spleen smears, spleen puncture was not carried out in 1922 when the serum was positive by formalin. except in early cases in which the formalin test fails. There is a popular impression in Calcutta that kala azar serums give positive Widals in the absence of previous infection with enteric or prophylactic inoculation. This belief was tested experimentally on a number of early and late kala azar cases and found to have no foundation. "Their sera never showed positive agglutination to any of the antigens in any dilution used." Three patients, 2 European, developed kala azar after infection with *B. typhosus*. It is pointed out that any prolonged or debilitating disease predisposes to other infections, and that in each of these diseases the polynuclears are much diminished. There are a number of the usual tables.

A. G. B.

NEW HEBRIDES. **Report for 1921 & 1922. (No. 1161.) Appendix.** [DAVIES (Vernon), M.D.]—pp. 10–12. 1923. London. H.M. Stationery Office. [Price 6d. net.]

Dr. Vernon DAVIES gives an account of the diseases met with at the Paton Memorial Hospital, Vila, and elsewhere in the New Hebrides. Naturally they do not differ much from those of neighbouring groups of South Sea Islands. The chief causes of sickness are stated to be tuberculosis, malaria, filariasis, amoebiasis, yaws and pneumonia. From enterica, plague, cholera, small-pox, bacillary dysentery and diphtheria the group appears to be free. Tuberculosis accounts for one-third of the deaths in the Vila hospital; the pulmonary form is most common, but inflammation of the cervical glands, joint tuberculosis and meningitis are frequent. Malaria is widespread and the greatest cause of ill-health among non-natives. Filariasis is generally distributed, but with unequal incidence in the islands; elephantiasis is seen on some islands but not on others. Muscular swellings, sometimes going on to abscesses, are frequent and are believed to be of filarial origin. Amoebiasis is endemic throughout the year and tends to become epidemic in January and February, when flies are at their worst; it is an important cause of death in all the villages. Yaws must cause much chronic ill-health. A form of periostitis affecting commonly the tibia, but "almost any bone," especially those forming the elbow joint, is attributed to yaws, but has occurred in Europeans who have shown no sign of that affection. Neosalvarsan fails; potassium iodide is successful. Gangosa is often seen. Leprosy is "scattered about the group." The author has never diagnosed syphilis, gonorrhoea is increasingly common, ulcerating granuloma is met with. Tropical ulcer and scabies are common. No investigation of hookworm has been made. The author hopes that "these islands still being virgin soil pathologically will attract a small laboratory." [See also this *Bulletin*, Vol. 17, p. 235.]

A. G. B.

MESLIN. **Considérations générales sur la morbidité et la mortalité en Annam pendant l'année 1921.**—*Ann. de Méd. et de Pharm. Colon.* Paris. 1923. May-June-July-Aug. Vol. 21 [22 *sic*], No. 2. pp. 174–182.

In the colony of Annam there are 20 native hospitals, and the number of admissions in 1921 was 29,127. Malaria came first with 2,861 cases and 175 deaths; benign tertian is the common form in summer, subtertian and quartan between October and March. The malaria index (blood and spleen) for villages inspected ranged between 40 and 50 per cent., and in some villages was 90 per cent. Syphilis affects all classes of society both in town and country. Tuberculosis is common among the lower classes; 685 cases were treated. About 95 per cent. of the patients admitted into hospitals harbour intestinal worms of some sort. The number of admissions for taeniasis was 348, and of filariasis only 12. There were 36 cases of amoebic liver abscess. A good many cases of deep-seated, insidious, apyretic abscess of muscles were observed, where no infective agent could be discovered. Trachoma and various forms of conjunctivitis furnished 1,920 cases. Among tumours several cases of sarcoma are specified. Diabetes was not encountered. The statistics for epidemic diseases deal with reported cases, and are as follows: smallpox, 295 cases, 29 deaths; cholera, 261 cases, 140 deaths; plague, 242 cases, 205 deaths; measles, 317 cases, 59 deaths; influenza, 593 cases, 80 deaths. The numbers of vaccinations effected were: variola, 608,832; cholera, 10,000; plague, 8,921, and 13,582 re-vaccinations.

A. A.

MATHIS (C.). **Considérations générales sur la morbidité et la mortalité au Cambodge pendant l'année 1921.**—*Ann. de Méd. et de Pharm. Colon.* Paris. 1923; May-June-July-Aug. Vol. 21 [22 *sic*]. No. 2. pp. 153-163.

In Cambodia in 1921 there were recorded for plague 446 cases, 439 deaths, and 9,375 vaccinations; for cholera, 1,054 cases, 674 deaths, and 9,780 vaccinations; for smallpox 462 cases and 178,500 vaccinations. The difficulty of preserving variola vaccine during distribution in the interior districts was overcome by packing the tubes in ice in thermos flasks. Influenza reappeared, but in a benign form. There were treated in hospital 72 cases of measles, of which 4 were fatal, and 90 cases of beriberi, of which 9 ended fatally. Tuberculosis is believed to be widely prevalent; 137 cases were treated in hospital and 59 deaths were recorded. Yaws is very common; in adults it yielded readily to 914, and in children to "liquor van Swieten." Of lepers 94 were interned in institutions; but the authorities are averse to interning any but those who have no means of subsistence, and would prefer that others should live near a leprosy dispensary for treatment: promising therapeutic results were obtained with iodosalyl chaulmoogra. Of rabies, 52 cases were treated, with 1 death—a child of 3 years: 21 rabid dogs were killed. The number of cases of amoebic dysentery treated was 380, with 55 deaths; no other form of dysentery is here recorded. Nothing of particular importance is mentioned regarding malaria, and nothing at all is said of helminthiasis or of venereal disease. The abuse of Indian hemp is noticed as a cause of insanity. Among the 467 maternity cases treated in institutions there were only 2 cases of twins.

The total number of cases treated in native hospitals of the colony was 6,650.

A. A.

LE DENTU (R.). **L'état sanitaire de la population indigène et le fonctionnement du service de l'assistance médicale dans la colonie de la Haute-Volta pendant l'année 1922.**—*Ann. de Med. et de Pharm. Colon.* Paris. 1923. May-June-July-Aug. Vol. 21. [*22 sic.*] No. 2. pp. 133–153.

Epidemic diseases.—*Relapsing fever*, hitherto unknown, was introduced into the Soudan in 1920 by native troops returning to their homes, and, though lousing centres were established and cases were isolated, it reached the Upper Volta colony across the Niger. It appeared first at Dori in the north in August, 1921. Thence it steadily spread. In eight named villages with a population of 5,376, 970 were attacked and 545 died. Body lice were the vectors. The symptoms were not unusual; epistaxis was frequent and jaundice never wanting. The natives distinguish relapsing fever from malaria by the pronounced prostration which is evident from the first.

Cerebrospinal meningitis, smallpox and influenza were infrequent this year. *Broncho-pneumonia* was very common in December, January and February, when a cold north-east wind blows; the disease is attributed to lack of clothing and susceptibility to the pneumococcus. *Anthrax* occurred in two villages where infected sheep and goats were eaten. Chickenpox and mumps affected the schools.

Endemic diseases.- Malaria is always frequent. In the absence of running water the natives make hollows in the ground in and round their villages; here Anopheles breed. Often these are borrow pits made in the course of construction of their huts. Both forms of dysentery are said to occur; the bacillary variety is mild. Venereal diseases are spreading in the villages. Sleeping sickness is found only in the region of the Black Volta. At one point two species of tsetse were captured, and here trypanosomes were detected in the blood of 8 out of 12 natives. Trypanosomiasis of horses is common in all the south of the colony, so that they are reared with difficulty. Guineaworm infection is widely spread. After the first rains the number of cases augments, to attain its maximum in mid-winter. *Taenia saginata* occurs in 50 per cent. of persons living round European stations. Leprosy exists chiefly in the south-west. Goitre is common, especially in women; children are seldom affected. Filariasis with lymphocele and hydrocele are common enough, but elephantiasis is rare. Intermittent haematuria is attributed (without parasitic evidence) to bilharziasis.

Infantile mortality.—This is high. It is attributed partly to pulmonary affections due to lack of clothing, to asphyxia in the efforts of the mother to keep the child warm at night, to green diarrhoea, the result of improper diet. Tetanus is not an important cause. Among serious faults of hygiene is cited the habit of the Massi women, who fill the mouth with water, usually dirty, and blow it into the rectum of the newly born child, for what purpose is unknown.

Medical relief.—There are nineteen dispensaries in the colony served by six European doctors, and two native midwives trained at the Dakar school. Among the diseases seen malaria accounted for 3,655, guineaworm 1,540, syphilis 793, goitre 399, tuberculosis 27, sleeping sickness 3.

Vaccination.—There are three vaccine farms, which in this year supplied 738,500, 218,200, and 225,000 doses of vaccine. It is sent out once a fortnight, in earthen water-containing vessels on men's heads; the water is renewed as often as possible. Vaccination is not done in the hot weather. The native vaccinators number 30. Of 467,000 vaccinations performed in the year about half were verified, and of those 57 per cent. took. Experiments with dry vaccine gave better results, but it is not considered wise to entrust the admixture with glycerine to natives.

A. G. B.

SERGENT (Edmund). **Rapport sur le fonctionnement de l'Institut Pasteur d'Algérie en 1922.**—*Arch. Instituts Pasteur de l'Afrique du Nord.* 1923. May. Vol. 3. No. 2. pp. 193–230. [60 refs.]

This extremely interesting Report of the Pasteur Institute of Algiers, for 1922, is a fine record of service not only for the public health but also for the economic development of that country.

From its first section, which deals with the routine work of the Institute, we learn that in 1892 the number of microscopical examinations, cultures, inoculations, serological tests, etc., carried out in behalf of the medical, veterinary, and agricultural departments was 8,062, and of chemical analyses 336; and that 2,810,965 units of vaccines, sera and other such biological products were issued, exclusive of those used in antirabic treatment. In the antirabic department 1,662 individuals were treated for bites inflicted by animals, which in 36 cases were proved to be rabid, in 579 cases were judged to be rabid from their symptoms, and in the remaining cases were suspected of being rabid; of the individuals treated, 3 died of rabies. In the routine of the malaria department minor periodic measures of cleaning, petrolage, etc., were continued in numerous districts. 180 kilos of quinine hydrochloride were distributed in the form of dragées, and 4·2 kilos in the form of chocolatines, and several thousand leaflets and pamphlets were circulated, as well as a "Précis of Malaria" for use in schools. Several scientific expeditions were organized, including a great malarial survey of Algeria, the chart of which will be published this year; and a laboratory has been established at Biskra to study the biology and pathology of the Sahara. Among other matters referred to in this part of the report is the publication in French and Arabic of a little book of a popular sort entitled "Le Livre de la bonne Santé."

The second section of the Report contains an account of the original work done in the Institute during the year. As most of this work has been published, and has been noticed in this *Bulletin*, we may here rather contemplate the spirit in which the work was done than the material results of the work itself. The leading motive of the Institute—and undoubtedly it is a motive that above all others justifies the supremacy assumed by Western Europe in the affairs of Africa—is in co-operation with the medical officers of the army of occupation to make the country healthy for the native inhabitants by rousing them from their pathetic fatalism in the face of epidemic disease. In the case of malaria the proposed standard of achievement is that exhibited by the plain of Mitidja. In former times this plain was a wilderness of Pistacia scrub and malaria swamp: to-day it is a vast expanse of cornfields, vineyards, and orangeries—an appropriate transformation for the country where the malaria parasite was discovered. Of the 28 original papers briefly reviewed in the Report, 14 relate to malaria, the other 14 deal with specific problems of relapsing fever, diphtheria, tuberculosis, enteric fever, undulant fever, oriental sore, and protozoology.

A. A.

Da Costa (E. Borges). **Institut de Radium de Bello Horizonte, État de Minas Geraes (Brésil).**—*Presse Méd.* 1923. Oct. 20. Vol. 31. No. 84. (Supplement.) pp. 1757–1759. With 4 figs.

In 1919, the President of the State of Minas Geraes, the most populous of the Brazilian States, having regard to the increase of cancer in Brazil as elsewhere, suggested the foundation in the State of an Institute for the study and control of that disease. Hence the Radium Institute at the capital of the State, which is here described. It is managed by a Council of Ten, which elects the Medical Director. Its aims are—the study and treatment of cancer and precancerous conditions; the study of radium and radio-active substances; the diffusion of advice and instruction to the public about cancer; the study of experimental surgery as an aid to surgical therapeutics. The building, which has cost over two million francs, is figured in plan and facade; it comprises a hospital of 120 beds. The Director is Dr. E. Borges da Costa, the writer of the note.

A. G. B.

Atkey (O. F. H.). **Kitchener Memorial Medical School at Khartum.**—*Brit. Med. Jl.* 1923. Sept. 29. pp. 581–582.

The object of the Kitchener Memorial Medical School, writes Dr. Atkey, is to provide a sound medical training for young Sudan Arabs so as to meet the need for doctors which at present exists and is likely to grow quickly with the development of the Sudan. That there is a demand for such a school from the natives is shown by the fact that they have themselves subscribed £11,000. It is intended to train young men selected from the final year students of the Gordon Memorial College, men therefore who have had a sound secondary education, at the outset twelve for a period of four years. Work in the out-patient department will begin simultaneously with the study of the preliminary sciences, and those who finally attain the standard fixed will receive a diploma to practise in the Sudan, where they will be under the direction of British medical inspectors. Later the standard will be raised and the curriculum prolonged to five years. The medical school is now in course of construction, opposite to the Civil Hospital of 100 beds, where the clinical training will be pursued. As to the need for the school, it is pointed out that there are immense areas throughout the Sudan, and especially in the southern regions, in which the population is far out of reach of any hospital or the visitation of Government Medical Officers, and where epidemics are unchecked. The diseases which have to be combated are discussed, schemes for the growth of cotton on a colossal scale are sketched, and the necessity indicated of a steady increase of the population, for which adequate medical and hygienic arrangements are essential. Moreover, "the quickest and surest way to pacification and civilization in Central Africa is to increase enormously the number of doctors."

May Dr. Atkey's project meet with the success it merits.

A. G. B.

LE DANTEC. **L'enseignement médical dans les colonies françaises.**—*Congrès de la Santé Publique et de la Prévoyance Sociale, Marseille, 11–17 Septembre 1922. Rapports.* pp. 355–388.

In this valuable paper the Director of the French West African School of Medicine at Dakar gives the story of the inception and development of medical teaching in the French Colonies, a subject which is or should be of great interest to our Crown Colonies in Africa and elsewhere. The creation of the medical school in Pondichery, French India, goes back to 1863 [1823 according to GUERIN], that of Madagascar to 1897, and of Indo-China to 1901. In French Africa, with its backward population, no school was founded till 1918. (See this *Bulletin*, Vol. 17, p. 218; Vol. 18, pp. 283 & 284.) Of each of these schools a full description is given, dealing with the selection of candidates, their maintenance, training, discipline, examination tests, and opportunities when qualified, the staffing, course of study. buildings and apparatus. In all the schools midwives are also trained, and in some pharmacists and *infirmiers*, the qualification of whom is that they have knowledge of French and have spent at least six months with a sanitary corps. The African school, though the last to come into existence, is in some respects in advance of the rest, for it has veterinary pupils who, as on the medical side, pass through a five years' course.

The author tells us that these schools are not the result of a demand from the natives, but of the need for medical personnel. The vastness of these territories, the difficulty of communications, call for numerous qualified men which the mother country cannot provide nor the colony pay for. On the other hand, the élite of the native youth, sharing the origin and language of the natives, are eminently suited for such work, and the pupils should be recruited from all the native races, so that they may practise among peoples whose traditions and language are essentially their own. At first it was believed sufficient to train good *infirmiers*, but it was found that they could not bear responsibility. A long training, moral as well as technical, is necessary if the native is to stand alone. At two of the schools the pupils are boarders, at two they live out. Le Dantec prefers the interne system, because the students have much to learn besides the essentials of their profession, and, living in, they become more quickly habituated to speaking and thinking French. They have uniform or at least European wear, which also helps to Europeanize their minds. Since the training is intended to adapt them to practise in their own country, the teaching is fitted to its pathology and hygienic needs, and here the author notes that there exists no work on tropical medicine as it affects the yellow or black races. The cinema is used for instruction at Dakar and Hanoi. In return for financial assistance, taking the form either of board or of money, the students sign an engagement to remain at least 10 years in the medical service of the country, and they are held to this by prohibition from practice except in that service. The bonds between the school and the student must not be broken when he graduates; he should be recalled at intervals for instruction, and it is necessary that the European instructors be changed as seldom as possible.

The midwife pupils spend their first year in the practice of the hospitals and dispensaries in the service of women and children; they are intended to advance hygiene as well as to act as accoucheuses.

Lastly, it is considered that the formation of these native schools of medicine will enable the French to combat with increasing success the well-recognized causes of depopulation, and so to contribute to the economic prosperity of the colonies.

A. G. B.

BORREL. **Hygiène et pathologie des contingents coloniaux en France.**—*Congrès de la Santé Publique et de la Prévoyance Sociale, Marseille, 11–17 Septembre 1922. Comptes Rendus.* pp. 62–78.

"It was the Senegalese troops that first attracted attention when, replacing the old veterans, the new recruits of 1915 came straight from the Bush to serve in France."

Borrel gives a vivid description of the arrival at Fréjus Camp of a battalion from Dakar after a fortnight or so of sea travel under anything but hygienic conditions: first the press of men to hospital with dysentery and pneumonia; then the gradual cessation of bowel complaints but a persistence of the pneumonias, broncho-pneumonias, congestions and attacks of bronchitis—all due to the pneumococcus—for the first three months or so. "*Et puis tout rentrait dans l'ordre, l'état sanitaire était parfait.*"

But this three months period of acclimatization cost, per 1,000 of strength, 150 or 200 cases of illness and 20 or 30 deaths.

Attempts to protect against pneumonia by means of vaccines were successful to a very considerable extent, especially when carried out during warm weather. They were less successful in winter-time. It was soon discovered that there was no need to vaccinate against pneumonia except during the first year of service in France. "*Il est donc inutile de vacciner les contingents anciens, la vaccination artificielle n'ajouterait rien à la vaccination naturelle.*"

In an experiment, for instance, on the battalions returning to Fréjus from the front after a winter in the trenches, 3,580 men were inoculated, 3,590 men were kept uninoculated as "Controls," and the incidence and mortality from pneumonia was carefully recorded in each group. The result was as follows:—

Amongst the Inoculated.—20 cases and no deaths in 3 months.

Amongst the Non-Inoculated.—24 cases and 1 death in 3 months.

It is clear that the non-inoculated were no more susceptible than the inoculated men. Compare with the above, an observation on a Madagascar Contingent just arrived at Fréjus Camp and inoculated with the same vaccine.

283 *Inoculated.*—1 case and no death.

213 *Non-Inoculated.*—17 cases and 4 deaths.

As Borrel says: "It is thus established that vaccination against the pneumococcus takes place naturally and spontaneously during the first year of acclimatization."

If pneumonia may be regarded as the outstanding risk to the African soldier in his first year, tuberculosis takes its place for all subsequent years of service in Europe, as will be clearly seen from the following table based on the deaths from this disease at Fréjus Camp in a garrison with a fairly constant strength of about 50,000 men during 1917 and 1918.

Deaths from Tuberculosis at Fréjus Camp.

Années.	1916	1917.	1918.	1919.
Janvier	1	14	17	36
Février	0	20	35	48
Mars	2	21	50	62
Avril	3	28	73	80
Mai	2	41	104	72
Juin	7	37	59	—
Juillet	7	32	67	—
Août	4	23	52	—
Septembre	6	27	38	—
Octobre	4	25	54	—
Novembre	3	19	43	—
Décembre	9	25	55	—
	48	312	557	298

These two diseases, pneumonia and tuberculosis, account for 95 per cent. of the morbidity of the Senegalese troops in France. The clinical picture on admission tends to afford a sharp contrast between the muscular, well-nourished, glossy-skinned pyrexial pneumonic patient and the dull-skinned, flaccid case of phthisis with oscillating temperature and, in many cases, palpable glands above the clavicle. " The diagnosis of tuberculosis in the Negro is very easy provided that, in the case of the Senegalese at least, one does not complicate matters by seeking for auscultatory signs."

In the course of inoculating the 7,000 Senegalese already quoted against pneumococcus infection, the importance of tuberculosis came into into sharp relief, many men being found to be suffering from this disease. It will be seen from the following table that battalions tended to differ, owing, no doubt, to differences in the number of infected persons in their ranks.

Battalions	71st.	68th	60th	44th	77th.	64th	70th	43rd.
Tuberculosis cases ..	2	7	17	5	1	4	4	3

A Table of periods of survival after admission to No. 66 Senegalese Hospital amongst 35 patients dying of tuberculosis is given by Borrel on page 68. *In this table it is seen that no less than 14 out of the total of 35 were dead within two months of admission, while the longest period of survival was 5 months and 16 days.* Borrel, attributing this to the reluctance of the Senegalese soldier to leave his comrades and enter hospital, instituted a system of " Diagnostic Inspections " of battalions, examining in this way the whole garrison of Fréjus camp once every month. The results, from June 1918 to May 1919, are given in the following table.

Table of Cases of Tuberculosis detected at Battalion Inspections.

	Dépistés.	Tuberculeux.
Juin 1918	170	100
Juillet	105	46
Août	94	48
Septembre	128	51
Octobre	108	29
Novembre	96	36
Décembre	158	85
Janvier 1919	257	150
Février	245	158
Mars	298	164
Avril	167	66
Mai	155	37
Total	1,981	970

By means of these diagnostic inspections Borrel was able to eliminate many potential foci of infection in the ranks, and he regards this "Monthly Inspection" as a matter of prime importance in the control of tuberculous disease amongst Colonial contingents serving in Europe.

In this paper the other causes of inefficiency amongst Colonial troops are also considered. Dysentery is regarded as very rare except as the immediate result of insanitary conditions on ship-board during the journey to France. Phagedenic ulcerations due to aggravation of old "jigger sores" are frequently seen on disembarkation, and may be very severe. They are caused by the absence of facilities for foot-washing during the voyage.

Another source of trouble is the marked tendency to "Frost Bite," attributable to the poor peripheral circulation of the Senegalese. Good food, warmth, suitable clothing and a winter spent in a dry, sunny camp as at Marseilles or Fréjus will go far to keep these troops fit. "*Il faut s'occuper des tirailleurs si on veut les utiliser.*" Borrel gives a delightful sketch of the cheerful, thoughtless, improvident but faithful and gallant Senegalese tirailleur, so devoted to the officers that treat him well, so amenable to discipline if this is tactfully and firmly administered. As one reads between the lines of his concluding paragraphs, one feels his generous admiration for a splendid military type, his sympathy for their dangers and sufferings in the cause of France. To a reviewer who has served with Sudanese troops this appreciation for the high qualities of the African warrior makes a deep appeal.

S. L. Cummins.

NATTAN-LARRIER (L.) & LAIGRET (Jean). **Les porteurs de germes et le recrutement de l'armée indigène.**—*Congrès de la Santé Publique et de la Prévoyance Sociale, Marseille, 11–17 Septembre 1922. Rapports.* pp. 263–276. [16 refs.]

The authors discuss the possible introduction of exotic diseases to Europe and of infections peculiarly associated with temperate civilization to the tropics as a result of the recruitment and dispersal of the great French native army. The question of the introduction of disease came up in 1910, when it was decided to transfer 800

Senegalese troops to Algeria, and the Société de Pathologie Exotique was asked to indicate what precautions should be taken. The sequel in this instance showed that though large numbers of natives were enlisted and were associated with French troops in many parts of the world they nowhere constituted a danger. It was rather the native troops that were threatened, by infections such as pneumonia and tuberculosis (BORREL). It is probable that they took tuberculosis back with them, for the disease has spread in French colonies since 1914, and they appear to have introduced relapsing fever into the French Sudan where the disease had not been known before [see this *Bulletin*, Vol. 20, p. 132]. It is concluded that the prophylactic measures taken before embarkation of the native recruits for France or Algeria proved effective. A period of observation of three months at this stage is none too long, both for examination and acclimatization, but is rarely practicable. The French Sudan experience suggests that before repatriation native troops should be loused.

A. G. B.

i. van BOECKEL (L.) & GEENS (J.). **Valeurs antigénique et immunogène comparatives des vaccins simples et des vaccins mixtes contre certaines infections à germes entérotropes.**—*C. R. Soc. Biol.* 1923. Oct. 20. Vol. 89. No. 28. pp. 844–848.

ii. ——, & ——**De l'influence du nombre des injections dans les vaccinations contre certains germes entérotropes.**—*Ibid.* pp. 852–856.

i. Experience in the war seemed to be decisive that for comprehensive protection against the enteric fevers a mixed T.A.B. vaccine was essential. The inferences drawn from the experiment fully recorded in this paper are that while for the individual exposed to frequent and varied risk and precluded from undergoing a series of independent simple vaccinations a mixed vaccination is convenient, yet for ordinary epidemic conditions a simple *ad hoc* vaccination is sufficient.

The authors' experiments show, in fact, that to a mixed vaccine, composed of equal quantities of different species of germs all provoking individually high antigenetic reactions, the organism generally reacts only to one of the species strongly, very seldom to all of them, and hardly ever to all of them equally strongly; as judged by agglutination tests 10 to 12 days after inoculation, one of the species seems to inhibit, either entirely or in part, the antigenetic powers of the others.

It must suffice here to give merely qualitative abstracts of the tabulated results of these interesting experiments:—

Ten rabbits received each a subcutaneous injection in saline solution of 2 milliards of killed bacilli consisting of equal quantities of (*a*) typhoid, (*b*) paratyphoid A, and (*c*) paratyphoid B: 4 animals reacted to *a* only and 1 to *c* only; 3 reacted to both *a* and *c* but unequally; 2 reacted to all three species, but most strongly always to *a*. Eight rabbits received a numerically and physically similar injection consisting of equal quantities of (*a*) typhoid, (*b*) para B, (*c*) Flexner, and (*d*) cholera bacilli: 1 animal reacted to *a* alone, and 1 to *c* alone; 2 reacted to *a* and *b*, and 1 to *a* and *c* but unequally; and 2 reacted unequally to *a*, *b*, *c* and 1 to *a*, *c*, *d*; none reacted to all four species. Six rabbits received a physically similar injection consisting of 2 milliards of a mixture of equal parts of (*a*) typhoid, (*b*) para A, and (*c*) para B, and 4 milliards of (*d*) cholera bacilli: 1 animal reacted to *a* alone; 1 reacted to *a*, *c*, and 1 to *a*, *d*, but unequally; and 2 reacted to *a*, *c*, *d*, and 1 to *a*, *b*, *c*, but unequally; none reacted to all four species. Eight rabbits received an injection, in oily suspension, of a mixture of 4 milliards of typhoid bacilli, and 2 milliards each of para A and para B bacilli: 1 animal reacted to typhoid alone; 4 to typhoid and para B, but in only one case equally; and 3 to all three species, but only in one case equally.

The authors also describe unsuccessful attempts to immunize rabbits against paratyphoid and dysentery and paratyphoid and cholera by mixed vaccines, in contrast with successful immunization by the respective simple vaccines in succession.

ii. It is known that, despite individual exceptions, the formation of anti-bodies and the degree of immunity acquired as a result of protective inoculation increase, up to an optimum, with the amount of antigen introduced at a given time. There is not, however, complete agreement—though there is a considerable amount of affirmative experimental evidence—on the point whether or not the phenomena in question are favourably influenced by a succession of inoculations. The authors therefore have made a number of experiments on animals and man, which are recorded in tabulated detail in this paper, to throw more light upon this question. The following are their conclusions: (1) That the human subject inoculated several times with a given quantity of antityphoid vaccine produces antibodies in greater abundance than the subject who receives the same quantity of germs at a single inoculation. (2) That with animals [rabbits and guineapigs] inoculated with a given quantity of paratyphoid, dysentery, or cholera vaccine, the abundance of antibodies produced and the degree of immunity acquired is in direct increase with the number of injections in which that quantity is distributed [1 to 4 injections at 8 days' interval, where recorded in the tables]. (3) That to secure solid and lasting immunity, as in the army, etc., 3 or 4 successive inoculations are preferable to the 1 or 2 that are desirable in pressing circumstances.

A. A.

CALMETTE (A.). **Les vaccinations microbiennes par voie buccale.**—*Ann. Inst. Pasteur.* 1923. Oct. Vol. 37. No. 10. pp. 900–920. [91 refs.]

A considerable volume of experiment has undoubtedly justified the principle of immunization against certain bacterial diseases by the buccal route, although further experimentation is necessary to determine the limitations and practical quantifications of the method, since at present it is not known (as, of course, it is known in the case of other established routes) what proportion of the immunizing vaccine is actually absorbed. The buccal route, however, offers so many practical advantages that the author, while still advocating caution, has thought it worth while to review the whole subject in its history and development, for practical ends.

The idea of vaccination *per os* naturally occurred to PASTEUR after he had observed that fowls that had eaten food contaminated with the microbe of chicken cholera, if they survived the accident, were vaccinated. In putting this observation to the proof of deliberate experiment with anthrax vaccine and sheep, however, the buccal method was found to be so inconstant in comparison with the certified subcutaneous method that further attempts at its development were discontinued. EHRLICH also, many years after PASTEUR, tried oral vaccinations, only to reject them as obviously inferior to the established methods. Many other authorities (including METCHNIKOFF and the author) also have experimented with oral vaccines, and have obtained satisfactory evidence of the production of antibodies, particularly in the case of microbes like those of typhoid and dysentery, which by recent research—in particular the bile sensitizing investigations of BESREDKA—have been shown to have a predilection for the intestinal mucosa, by whatsoever route they are introduced into the body.

1. *Buccal vaccination against bacilli of the enteric group.*—From the earliest experiments it was concluded that the immunity thus conferred was a temporary " tissue immunity " localized in the intestinal mucosa and not protective against infection by other routes than the mouth. But in 1911 COURMONT and ROCHAIX administering to rabbits and goats, *per os* and *per rectum*, mixtures of several strains of enteric cultures killed by heat, conferred immunity lasting for 3 to 6 months, and found that the animals' serum was agglutinant and lytic. Later, LUMIERE and CHEVROTIER administered polyvalent antityphoid vaccines by the mouth in keratine capsules, to avoid loss in the stomach, and with charges of 3 milliards of microbes per kilogm. of animal, given in three doses at intervals of eight days, obtained for rabbits and guineapigs an immediate immunity, which held good for a year, against virulent infection in mortal doses. These " enterovaccines " have been freely and satisfactorily used since 1914.

The author refers to BESREDKA's experiments with rodents demonstrating the selective affinity of typhoid bacilli for the intestinal mucosa, through the " sensibilizing " action of bile; and to buccal vaccination with bile as an adjuvant, although he does not consider bile necessary in the case of man. Finally, he gives statistics of two outbreaks of typhoid fever in which buccal vaccination was tested in comparison with subcutaneous injections of T.A.B. In one of these, at Pas-de-Calais, vaccination was started after 29 cases had occurred, and 30 cases occurred after vaccination had been instituted: among 1,236 persons who ingested vaccine (+ bile), 5 were attacked the same day or the next, and 2 were attacked 10 days afterwards; among 173 persons inoculated with T.A.B., 4 were attacked between the fifth and twelfth day afterwards; and of 630 persons who refused vaccination 21 were attacked; the ingestion of microbes and bile, however, was not superintended by a responsible medical officer. In the other outbreak, at the Prytanée of La Flèche, vaccination was not started until the epidemic was declining: 253 pupils were then vaccinated subcutaneously with T.A.B., and 268 ingested killed bacilli (+ bile); among the former 10 were attacked during the 20 days following, and among the latter only 5 were attacked during the first 11 days before the cessation of the epidemic.

2. *Buccal vaccination against dysentery bacilli.*—ZEITLIN, in 1905, began by swallowing increasing doses of bacilli killed by heat, without any ill effect, but without the acquisition of any agglutinant or bacteriolytic power in his serum. Next SHIGA and his pupils succeeded in immunizing rabbits to intravenous injection of dysentery toxins; by ingestion of killed cultures of the Shiga bacillus, but the animals always died of paralysis within a few days, and the controls succumbed to diarrhoea, etc. Subsequently, DOPTER, from his experiments, concluded that buccal vaccination for man was an improbability. BESREDKA, however—who demonstrated the " enterotropism " of the dysentery bacilli, by preliminary sensitizing of the intestinal

mucose with bile—while confirming the harmlessness of buccal vaccination and the non-appearance of antibodies in the serum of animals so vaccinated, concluded from his experiments on rabbits and mice that a single ingestion—or, better, two ingestions—of killed bacilli conferred immunity ; and finally there is the practical experience of NICOLLE & CONSEIL (see this *Bulletin*, Vol. 20, p. 115), who administered emulsions of 10 milliards of virulent Shiga bacilli to four men, two of whom had 15–18 days previously ingested three successive daily doses of the heated bacilli : these two men were immunized, the other two contracted typical dysentery.

3. *Buccal vaccination against cholera.*—Though the intense " enterotropism " of the cholera vibrio, by whatsoever route it may be introduced, has been demonstrated experimentally, a similar enterotropism has been demonstrated for the vaccine, so that the established method of subcutaneous inoculation does not require modification.

4. *Buccal vaccination against other bacterial diseases.*—Experiments of GUERIN and the author have shown that animals can be rendered refractory to the tubercle bacillus for considerable terms by ingestion of non-virulent cultures of that bacillus.

It has been demonstrated (by the author and PETIT) that virulent staphylococci ingested by rabbits can be found in the animals' blood within six hours and can produce their effects spontaneously or after a traumatism ; and, conversely, COURMONT and ROCHAIX have shown that rectal injections of heated cultures (70° C. for four hours) can retard the effect of virulent cultures subsequently injected into the blood, and also that by rectal injections of killed cultures of the pyocyanic bacillus immunity against that bacillus is conferred.

A certain amount of desultory experiment with vaccination *per os* or *per rectum* against plague, diphtheria, and bovine plague is also briefly reviewed.

Within the limits of an abstract, however, it is not possible to do justice to a long paper which itself is a summary of forty years' history of an idea : only a few salient points of practical significance have here been indicated.

A. A.

FERNANDEZ (H. E.). **Notes from the Diary of a Prison Doctor.**—*Med. Jl. S. Africa.* 1923. June. Vol. 18. No. 11. pp. 275–278. With 1 chart.

These notes relate to the convict prison at Point Natal, the average daily population of which, in the year 1922, was 566, and the average daily number of patients in hospital seven. There was a good deal of scurvy, although the scale of diet was reasonable and included cooked vegetables and, usually, soya beans. It had been the custom, however, to leave the food cooking or partially cooked for a long time before it was issued ; when this custom was rectified there was a general improvement in the condition of the convicts. Actual cases of scurvy appear to have been effectively treated by the addition of a pound of tomatoes to the daily ration and an increase in the amount of meat. An extraordinary case of septicaemia is recorded. Nothing very much wrong could be made out with the patient until the 21st day after his first admission to hospital, when a considerable swelling appeared in the pubic region. On the 22nd day an intensely irritating papular rash appeared in that neighbourhood, which on the 23rd day had spread over the head, trunk and thighs, becoming confluent in places. Scratching turned the papules into ulcers, the pus from which gave a pure culture of *Staphylococcus aureus.* After some rather profuse diarrhoea the patient died on the 24th day.

A. A.

SOREL (F.). **Relation d'un voyage de Dabola à Kankan-Kissidougou. Rives du Milo et du Niger et région de Dalaba (Fouta-Djallon).**—*Bull. Soc. Path. Exot.* 1923. July 11. Vol. 16. No. 7. pp. 496–500.

The object of this tour along the sources of the Niger was to get some idea of the incidence of malaria and of the infantile mortality. Very nearly 6,000 children were examined, and the number of those having enlarged spleens ranged according to locality from 31·7 to 54 per cent., being highest in the villages nearest to the river. It was noticed that, in the collections of children assembled at the villages those under four years were generally about twice as numerous as those above seven, suggesting a high mortality between those ages. Infantile death-rate was arrived at by questioning the matrons, and although the author gives some exact figures it is perhaps sufficient to say that according to the matrons' testimony nearly 5 per cent. of infants die almost as soon as they are born and about 50 per cent. die before the age of 4–5 years.

A. A.

COMBY (J.). **La question du paiement des soins médicaux par les indigènes au Maroc.**—*Presse Méd.* 1923. June 13. Vol. 31. No. 47. p. 982.

The French doctors in Morocco were asked by the authorities to recover from non-indigent natives the cost of drugs or dressings and of treatment in hospital. It was found that it was difficult for the doctor to distinguish the rich from the poor, that the country natives could not be expected to pay, that in the towns a varying percentage could pay, but preferred to go to a pharmacist or private practitioner, that such a result would prejudice the ultimate benefit of the country for a slight temporary advantage, and that the recoveries in six months did not exceed 45,000 francs. In Rabat, in March 1922, with gratuitous treatment 2,059 intravenous injections were given for syphilis. Two francs was asked per injection, and in March 1923 the figure fell to 866. Later, these neglected patients would apply for admission to hospital and receive a much more costly treatment.

A. G. B.

WHYTE (G. Duncan). **Medical Missions.** [Correspondence.]—*Brit. Med. Jl.* 1923. Sept. 15. p. 488.

This letter is in the main a protest against the doctrine that any young medical graduate can be "too good"—in a professional sense, of course—"for the mission field." Quite apart from things of the spirit, the multifarious responsibilities—embracing many special branches of medicine, surgery, obstetrics, and hygiene—that fall upon a practitioner who commonly is sequestered from professional assistance can be discharged only by a man of great ability and voluminous skill. [It is to be hoped that these excellent sentiments will be honoured by missionary societies as freely as they are endorsed by the medical profession.]

A. A.

BALFOUR (Andrew). **Problems of Acclimatisation.**—*Lancet.* 1923. July 14 & Aug. 4. pp. 84–88; pp. 243–247. [56 refs.]

These two lectures are a judicial summing up of much evidence regarding the effects of tropical climate upon the Caucasian, considered more particularly in their bearing upon the question of permanent European settlement in the tropics. For any but philosophers it is an exasperating subject, quite apart from its inherent perplexities; there is so little to take firm hold of; so much is merely general impression and opinion; and when one comes upon a few grains of fact they do but serve to start fresh controversy. The lecturer, however, has performed the good service of searching and sifting and systematizing this varied and uneven material, and out of the fulness of his experience has added to this critical analysis certain cautious conclusions that it will be sufficient to summarize.

He has no doubt, of course, that the individual settler in the tropics who takes care of himself can enjoy " a fair measure of health, for considerable periods at a stretch," and he also readily concedes that " a certain proportion of white men and a few white women can carry on active outdoor life in tropical heat year in and year out without much detriment to their physical and mental vigour." But in respect of permanent settlement, though at one time he was disposed to share the favourable view of GORGAS, he is now inclined towards the reactionary opinion " that the hot and humid tropics are not suited to white colonization and never will be, with our present knowledge, even if they are rendered as free from disease as England," while as to the dry and elevated areas within the tropics he still reserves his opinion, but not without foreboding. This foreboding he justifies by the doubt whether even in these favoured tracts the climate is sufficiently varied and changeful to impart that recurring stimulation which is so essential for the continual redintegration of mental vigour. [Here we seem to hear the echoes of the old haunting theme of the lotus eaters and perpetual summer afternoon.] In the peroration, however, the spirit of the lecturer rises above the misty wilderness of opinions and preconceptions and penetrates the veil of futurity: Hygiene has done much to defeat climate; can it not perhaps alter climate? " We are only beginning to realize what electricity can accomplish."

A. A.

BALFOUR (Andrew). **Sojourners in the Tropics.**—*Lancet.* 1923. June 30. pp. 1329–1334. [25 refs.]

This paper goes a good deal further than its title implies, since it deals not so much with the " sojourner " (unless in the Psalmist's sense of that word) as with the question whether the white man can ever make a settled home in the tropics. The author does not adjudicate this larger question, but in reviewing and marshalling the historic evidence as to the effects of climate on the descendants of white men expatriated by fate or fortune in the tropics he gives a good illustration of the soundest of methods of getting an answer to that question. He has thus rendered good service in a field where at present there is a plentiful lack of perspicuous definition and where much of the "evidence" offered has been assertion, or prejudice, or half-truth, or argument from vague assumption. Even in treating the subject from the historic standpoint one is hindered, as the author points out, by ambiguity in the term "climate," so that what is really due to concomitant adverse conditions is often attributed directly to climate—to the overpowering rays of the sun, to great heat and humidity; and even those who endeavour to separate the effects of climate upon expatriated and isolated white communities from the effects of inbreeding have failed to understand that the term "inbreeding" requires to be carefully qualified, since (although inbreeding from bad stock must lead to degeneration) there is no historic evidence that inbreeding from thoroughly good stock has any bad results and, indeed, experimental evidence is all the other way.

In his survey the author, with full cognizance and appreciation of all the necessary limitations and qualifications of the evidence, but without any impossible attempts to be too explicit, begins with those more or less pure white communities whose ancestors were carried to the tropics a good many generations ago and ends with those which are still being reinforced from the original European sources. Of the former kind some, like the poor whites of Jamaica, Barbados, Grenada, and the Bahamas, are said to have degenerated physically and perhaps mentally; while others, like the descendants of the original European settlers in certain islands of the Caribbean and neighbouring seas (Saba, St. Martin, Curacoa, Cuba) and in Mauritius and the Dutch East Indian island of Kissa, are said to have maintained their pristine physical and mental vigour. Of the latter kind some, as in South Africa, are said to contain a considerable proportion of whites who have fallen below the ancestral standard; though others, as in Panama, Espirito Santo in Brazil, Rhodesia, and Tropical Australia, are far from showing any conclusive evidences of deterioration.

In the jar of conflicting opinions the author appears to have taken a "cross-bench" station - as, indeed, seems to be most reasonable to those who think of the wonders that have been worked by man since his first appearance on the geological horizon.

A. A.

HEWETT ((Godfrey). **The Dusuns of North Borneo.**—*Proc. Roy. Soc.* 1923. Aug. 1. Ser. B. Vol. 95. No. B 666. pp. 157–163.

The Dusuns of Borneo—known to white men by the puzzling name of Sun Dyaks—claim to be, and have traditionally been allowed to be, direct descendants of former Chinese settlers. This claim has recently been impugned on the ground that MARCO POLO said nothing about it. The author, therefore, as he considers the Dusuns to be the most interesting of all the tribes inhabiting Borneo and much deserving of scientific study, makes here an attempt to corroborate their avouched and legendary claims. Appealing to history, he states that when in the early part of the 13th century KUBLA KHAN established his sovereignty over China and the Malay States, the Chinese had a large sea trade, which extended even to Madagascar and Africa and brought the great Mongol emperor into collision with the Indian monarch MAJAPAHIT, whose sway extended, through Sumatra and Java, to Sarawak, where Chinese trade had been carried on unchecked probably for 2,000 years. KUBLA KHAN's attempt to extort homage and tribute from MAJAPAHIT by an invasion of Java failed, but tradition says that his invasion of North Borneo was successful, and that large Chinese settlements were established there. Furthermore the author cites Sulu records and the "Selesilah" of Brunei, in which a local potentate A.D. 1375 is described as the Chinese rajah. Appealing to circumstantial evidence the author points to wonderful irrigation channels, still in use in Dusun country, which could only have been made by skilled engineers, and to a bamboo bridge over the Tampasuk River, far beyond the imaginative and constructive powers of present day Dusuns, but of a type common enough in China, Tibet, and the Shan States. He also points out the significance of the name of the great Mount Kinabalu, which means "Chinese widow." Finally he finds confirmation of his argument in an allegorical legend of a *dragon* guarding a jewel on the top of Kinabalu and fleeing when the jewel was stolen, but leaving certain Chinese behind.

A. A.

SANTOS (Francisco O.). **Metabolism Experiments with Filipino Students in the United States.**—*Philippine Jl. Sci.* 1923. July. Vol. 23. No. 1. pp. 51–66. [19 refs.]

The purpose of these experiments was to ascertain whether it is possible for Filipinos who have resided one year or more in the United States and have become accustomed to American diet to remain in nitrogen equilibrium when receiving a Filipino diet of fish, rice, meat and vegetables. The subjects were four Government students taking post-graduate courses at Yale, the diet consisted of salmon, ham, lettuce, sweet potato and bananas, and the quantity was unrestricted. The result is shown in a series of tables. A positive nitrogen balance was obtained in all, and in no instance was the caloric intake less than 14 per cent. above the basal requirement. Analyses of the urine are given and compared with the figures of other observers.

There are reasons for thinking that the common Filipino diet is poor in.salts. The bones of fish are usually eaten as well as the flesh, and pregnant or nursing women chew buyo, a thick paste of calcium hydroxide, spread on fresh betel leaves, and eat cigar or cigarette ash.

A. G. B.

COVELL (Gordon). **The Laevulose Tolerance Test for Hepatic Efficiency, and its Application in Certain Tropical Diseases.**—*London School of Tropical Medicine. Collected Papers: Clinical and Pathological.* 1923. Part 2. No. 12. 14 pp. With 12 charts. [4 refs. Reprinted from *Guy's Hospital Reports.* 1923. July. pp. 354–367.

MACLEAN and DE WESSELOW (1921) pointed out that the only sugar in ordinary use the consumption of which did not produce a rise in the blood sugar concentration was laevulose. SPENCE and BRETT*, applying this test, concluded that in a subject with diminished liver efficiency a definite rise in the blood sugar followed the ingestion of laevulose, the height and length of the curve being a measure of the degree of the inefficiency. Details are given of the method of estimation of the sugar done just before and one and two hours after the laevulose was taken. In 10 normal persons the rise in blood after cellose ingestion was very slight. Of 13 general medical cases, in 9 the rise was slight, and in 4 it was greater, especially so in the case of a negro suffering from severe arsenical neuritis. In 14 patients with evidence of hepatic disease, non-tropical, there was an abnormal rise in all cases but two.

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* *Lancet,* 1921. Dec. 31. p. 1362.

To come to the tropical cases, six cases of sprue were tested; three were normal, two showed slight liver inefficiency and one moderate liver inefficiency, but he had also a positive Wassermann. Of 15 cases of amoebiasis all but three showed more or less liver inefficiency, and in the stools of these histolytica cysts were not present. Most of the remainder had cysts, and in most instances the liver could be felt. In several instances the liver acted normally after treatment. The author concludes that the claims of MACLEAN, SPENCE and BRETT are corroborated, that the test forms a valuable indication of hepatic disease in cases where there is no clinical evidence of it, that in chronic sprue there is no considerable degree of liver inefficiency, that in amoebiasis the liver is affected in the great majority of cases, and that by repetition of the test the effect of treatment on the liver can be estimated.

A. G. B.

FOURNEAU (E.), NAVARRO-MARTIN (A.) & TRÉFOUEL (M. & Mme.) **Les dérivés de l'acide phénylarsinique (arsenic pentavalent) dans le traitement des trypanosomiases et des spirilloses expérimentales. Relation entre l'action thérapeutique des acides arsiniques aromatiques et leur constitution.**—*Ann. Inst. Pasteur.* 1923. June. Vol. 37. No. 6. pp. 551–617. [Numerous refs. in footnotes.]

This long paper is a sort of monograph on the aromatic arsenates—their preparation and their toxic and therapeutic action. It cannot be summarized to any advantage, and it must suffice to represent the authors' point of view and to state some of their larger generalizations.

The authors' proposition is that the series of aromatic arsenic acid compounds have been neglected in favour of the arsenious acid series, owing to the fact that the former (*e.g.*, atoxyl and its acid derivatives) have no trypanocidal action *in vitro* and cause nerve trouble (amaurosis in man), whereas the latter are effective even in extreme and harmless dilution. They insist (1) that action *in vivo* does not necessarily correspond with action *in vitro*, since certain preparations of the arsenic acid series are more effective *in vivo* than some of the arsenious acid series, and (2) that although many of the arsenic acid series cause nerve trouble some of their derivatives have no such effect; and they further argue that since, for instance, the isomeres of 606 have not the spirochaeticidal value of 606 itself, it is quite rational to imagine that the properties of 606 may be due not exclusively to its arsenic function, but to the isomeric modification which has placed its nitrate function in the *meta* position relative to its arsenic function instead of in the *ortho* position.

The authors' preliminary line of argument is that all investigations on this subject are tainted because of the great difficulty of obtaining the various compounds in a state of purity. They illustrate this argument (1) by the case of 606, different samples of which are known to vary in toxity from 0·08 to 0·20 gramme (per kilo weight of given animal) according to their manner of preparation; and (2) by comparing the toxity of amino-oxyphenyl-arsenate of soda as determined by EHRLICH with that of the same salt prepared in a state of infinite purity and tested by themselves—in the former case, for a mouse of 20 grammes, it was about 0·025 gramme, in the latter case 0·035 gramme. They add the interesting observation with regard to oxyaminophenylarsenic acid, that a neutral solution made with the calculated quantity of carbonate of soda may be more toxic (in extreme cases one-third more) than the corresponding amount of the recrystallized soda salt.'

The authors' researches, which have been conducted with products of standard purity prepared by themselves, have been concentrated particularly on the alterations in toxic and therapeutic effect brought about by the adjustment and re-adjustment of different functions substituted in the phenylarsenic molecule.

The following are some of the conclusions of greatest generality:—

The amine function when substituted in the *para* or *meta* positions has a positive disintoxicant power and slightly increases the parasiticidal effect of phenylarsenic acid; the *ortho* position is always bad. A second amine function, alongside the amine function in the *para* position, transiently diminishes the toxic effect. A third amine function increases the toxic effect and lessens the therapeutic effect.

The phenolic function OH increases the parasiticidal action of phenylarsenic acid even more than the substitution of the amine function, but the position of OH does not seem to exercise the same importance, except that *ortho* alone is bad.

The product which (with small animals) gives the best results, " and consequently contains the best functions in the best possible positions," is 4 amino-2 oxyphenylarsenic acid (269).

The acetylation of the amine function of 189 and most of its isomeres has an unfavourable effect in the treatment of trypanosomiasis (except when the amine function is in the *para* position), but not in the treatment of spirillosis; and stovarsol (acetylamino-oxyphenylarsenate, or 190) administered by the mouth not only cures but also forestalls syphilis.

A. A.

KNIPPING (H. W.). **Ueber die Ernährung des Tropenbewohners.** [The Alimentation of the Tropical Resident.]—*Arch. f. Schiffs- u. Trop.-Hyg.* 1923. Nov. Vol. 27. No. 11. pp. 404–413. With 1 fig. [4 refs.]

In the present article the author makes a further contribution to his study on nutrition in the tropics (see this *Bulletin,* Vol. 20, p. 922). Much that he lays before his colleagues in those parts is culled from other authorities and contains but little new to those accustomed to deal with diet. That the basal metabolism is somewhat lower for warm climates (the author states 10–15 per cent.) is not unexpected, and that what RUBNER calls the specific dynamic action of foods (specially noteworthy in protein metabolism) does not materially differ from the normal in the tropics is also what one would anticipate. Protein intake should not fall below a certain minimum, and that vegetable protein is not of the same nutritive value as that of animal origin are physiological commonplaces, and that in hot climates the protein should not exceed the minimum is the advice derived from universal experience. The need for vitamins and for roughage in the shape of cellulose is not confined to the tropics; the same can be said for the unwisdom of a heavy midday meal and the advisability of dividing the intake into more equable portions throughout the day.

W D. Halliburton.

ABBATUCCI. **Les stations hydro-minerales des colonies françaises.**—*Congrès de la Santé Publique et de la Prévoyance Sociale, Marseille, 11–17 Septembre* 1922. *Rapports.* pp. 249-262.

In giving a sketch of the mineral water stations of the French Colonies the author notes that the two chief possessions, Indo-China and French West Africa, are poorly served, the most important springs, being found in the volcanic islands. Madagascar is especially favoured in its thermal springs at Antsirabe, at 1,500 metres altitude, the waters of which have been frequently studied. The climate is delightful. There is a doctor in residence and a hotel in course of construction. The mineral waters of Algeria come in also for mention.

A. G. B.

DE JONG (D. A.). **Microörganismen en lage temperaturen.**—*Tijdschr. v. Vergelijkende Geneesk. enz.* Leiden. 1923. Sept. 26. Vol. 9. No. 3. pp. 214–218. [4 refs.] (English summary pp. 219–221.)

Some observations on the resistance of micro-organisms to low temperatures, made at Leiden in the course of experiments in conservation of meat and fish, are here recorded. Different species of dysentery bacilli were killed at —20° C., and this observation was confirmed. Enteric bacilli, *B. coli*, *B. faecalis alcaligenes*, and *B. lactis aerogenes* were not killed at —20° C. (ice-chest), or at —190° C. (liquid air), or at —253° C. (liquid hydrogen). *Trypanosoma lewisi* died after 80 minutes at —20° C. and after an hour at —30° C., and after 2 hours at —190° C. (liquid air). *T. evansi* became harmless after one day at —5° to —11° C.; after 90 minutes at —20° C.; and after 9 minutes at —191° C. (liquid air). *T. equiperdum* lost its virulence after 3¼ hours at —20° C. but remained alive after 21 days at —191° C. (liquid air); and *T. venezuelense* and *T. brucei* reacted in almost the same way as *T. equiperdum*.

A. A.

(i.) FOUCHÉ (F. P.); (ii.) HOLLANDER (Bernard); (iii.) SHARP (N. A. Dyce); (iv.) BLAIR (M. Cameron); (v.) WALKER (J. Bell); (vi.) ORENSTEIN (A. J.). **Freedom of Negro Races from Cancer.** [Correspondence.]—*Brit. Med. Jl.* 1923. June 30 p. 1116; July 7, p. 46; July 14, p. 86; July 21, pp. 130–131; Aug. 11, p. 268; Aug. 25, p. 342.

i. During 6½ years in the Orange Free State among a population, mainly Basuto, of 14,000, the writer did not see in a native a single case of gastric or duodenal ulcer, colitis, appendicitis, or cancer, although these diseases were " frequently seen " in the white population. On the other hand, when sojourning in the Western Province of South Africa, he saw 2 cases of carcinoma of the breast in native women of the local coloured race, a race that has lived under civilized conditions for the last 300 years. The writer thinks that these facts are worthy of serious consideration.

ii. Quotes the African explorer, STANLEY, and certain medical correspondents, as to freedom of natives in Africa from cancer, and the belief of some of the correspondents that this immunity is the result of vegetarian diet.

iii. States that even in coast towns of W. Africa, where natives have been in contact with Europeans for 400 years, cancer is extremely rare, and that in N. Nigeria only one case (mamma) has been recorded in recent years. States also that in the course of two years in Abyssinia he never heard of a case of cancer.

iv. States that in the course of 22 years' watch in Nigeria he has never seen a case of carcinoma or sarcoma, though carcinoma has occasionally been reported from coast towns and chiefly in natives who have been in touch with European customs. Points out, however, that hardly anything is known of the indigenous pathology of the unsophisticated interior country.

v. In 1904 saw a case of epithelioma of the penis in a Nyasaland negro—the first known in that region; the patient had come from a place where he "would come a good deal in contact" with European habits.

vi. In the course of a hundred consecutive autopsies of native African mine labourers (of whom the majority are between 25 and 40 years of age) the author has observed two cases of carcinoma, both being in men of the Shangaan race. In one case the pancreas and the glands of the neck, in the other case the liver, were the organs affected. Dr. PIRIE, of the South African Institute of Medical Research, also has published several cases of carcinoma in (? African) natives [see this *Bulletin*, Vol. 20, p. 213].

A. A.

PRENTICE (George). **Cancer among Negroes.** [Correspondence.]—*Brit. Med. Jl.* 1923. Dec. 15. p. 1181.

The author, who writes from Nyasaland, had accepted the belief that negro races are exempt from cancer until he encountered a negress with a tumour resembling an early scirrhus of the breast, which he did not see again until it had destroyed not only the breast but also the bony chest-wall beneath, and had laid bare the heart. Since that he has seen epithelioma of the face, destroying the eye and attacking the orbit; a malignant tumour that had split the face and displaced the eyes to a lateral position; fatal cancer of the ovary; malignant disease of the liver; and tumours of the testicle which, if not cancerous, were of nature unknown. He has not seen cancer of lip or mouth.

If there be any relative immunity to cancer, it cannot surely be attributed to abstinence from meat, for the negro will eat all the meat he can get, whether still warm prey or full of maggots, and he is only a vegetarian of necessity. The one circumstance ever present to the civilized man, but absent from the philosophy of the negro, is worry. The negro's grief is washed away in a flood of tears. If there be some negro immunity from malignant disease, may this be a factor?

The author muses over the immense field before the histo-pathologist in tropical Africa, where all the world is so busy looking for parasites in blood and stools.

A. A.

ADLER (S.) & CUMMINGS (E. H. Taylor). **Malignant Growths in Natives of Sierra Leone.**—*Ann. Trop. Med. & Parasit.* 1923. Dec. 21. Vol. 17. No. 4. pp. 535–537. [4 refs.]

It has often been stated, the authors write, that malignant growths are rare or absent in West Africans, and this has been attributed to non-adoption of European habits, but Europeanization, "whether or not it were conducive to the spread of malignant growths, would certainly be responsible for intelligent natives afflicted with them consulting medical officers. Thus civilisation may be wrongly blamed for the spread of the disease, when it is only responsible for its diagnosis."

The authors record eight cases in West African natives, five of which came under their observation between May and November, 1922. Six were in aborigines, two in "Creoles." The former were, melanotic sarcoma of the foot, epithelioma of the scrotum, meningo-sarcoma in the temporal region, primary and secondary carcinoma of liver and carcinoma of breast. The growths in "Creoles" were epithelioma of lip and primary carcinoma of liver. Diagnosis was in each instance the result of section of the tumour.

A. G. B.

DEKESTER (Maurice). **Le cancer au Maroc.**—*Bull. de l'Assoc. Française pour l'étude du Cancer.* 1923. Jan. Year 16. Vol. 12. No. 1. pp. 31 48. With 2 figs.

The author points out that in Morocco special measures are in force for combating venereal diseases, tuberculosis, malaria, typhus and plague, but not for combating cancer. He himself in five months at a hospital at Fez has seen 16 cases of malignant disease which he describes. All but one were epithelioma, in 9 cases of the skin, in 4 of skin and mucous junctions, and in 2 of glands. He has also seen 2 tumours of bone, 6 of the breast, and others of the pylorus and liver, and thinks that the view that cancer is rare in warm climates must be abandoned.

A. G. B.

NEVE (Ernest F.). **Kangri-Burn Cancer.**—*Brit. Med. Jl.* 1923. Dec. 29. pp. 1255-1256.

Since the year 1881 there have been 2,491 operations for epithelioma in the Kashmir Mission Hospital, and of these 2,000, or 84 per cent., were for *kangri* cancer. The *kangri* is described as an earthenware bowl 5 or 6 inches in diameter, surrounded by basket work and surmounted by a wicker handle. It is heated by means of wood charcoal and is worn against the skin under a single loose garment. The growths are commonly found on the inner sides of the thighs and the anterior surface of the abdomen, above or below the umbilicus. It is commoner in men than women, and the average age of onset is 55. Apart from the *kangri*, small pigmented patches or papules may be found all over the body of many elderly Kashmiris. The constant application of heat leads to every degree of chronic dermatitis, from mere redness to thickened patches, warty projections, or horny outgrowths from the surface. Scars are frequent. The cancer is met with in three forms—a circular or oval ulcer about 1½ inches in diameter, with deep crater-like centre and raised edges, the commonest form;

a cauliflower excrescence; an excavation with little evidence of over-growth, generally in the aged. These cancers are always very foul. The average duration of life is 15 months. The glands are infected in 50 per cent. of the cases; in operating they should be dealt with first. Twenty per cent. recur.

A. G. B.

i. SPITTEL (R. L.); ii. DAVIDSON (James); iii. TURNER (Percy E.). **Betel Chewing and Cancer.** [Correspondence.]—*Brit. Med. Jl.* 1923. Oct. 6, p. 632; Oct. 20, pp. 733–734; p. 734.

iv. ——. **Betel Chewing and Cancer.**—*Ibid.* 1924. Jan. 26. p. 158. With 1 fig.

i. A writer on the causes of cancer having expressed a doubt whether cancer in betel chewers is the result of irritation, Dr. Spittel gives his Colombo experience. He finds that cancer of the cheek is among the commonest malignant growths in Ceylon, and as frequent in women as in men. He has no doubt that the condition is due to irritation, and thinks that it is the lime which is the irritant. The disease begins as a leucoplakia or roughening of the part of the buccal mucous membrane that lies in contact with the molars and premolars, themselves coated with deposits of tartar and lime, providing a sandpapery surface. Carcinoma of the penis is also surprisingly frequent and is attributed to congenital phimosis and the irritation of caked smegma.

ii. The writer cites published statistics of the frequency of buccal cancer from Neyoor Hospital in Travancore. Of 1,700 cases of cancer collected by BENTALL buccal cancer formed no less than 70·6 per cent. The writer has records of 222 cases of buccal cancer from the same hospital, operated on in seven years, and gives some details of the preparation of the quid. Among the Brahmin community, who chew freely, few cases of buccal cancer are seen.

iii. Dr. Turner gives his experience of South India. At Nagercoil, at the tip of the peninsula, he has sometimes operated on three and four cases of buccal cancer in a week. He agrees with SPITTEL as to the early stage and course and gives details as to the involvement of glands, but differs from DAVIDSON in that cases are "quite common" among the Brahmins. In the minority of persons who do not chew buccal cancer was not seen.

iv. Spittel writes that buccal cancer in Ceylon is met with most frequently between the ages of 35 and 50, but is not rare between 25 and 30 and especially in Tamil women. Tamils take to betel chewing earlier and with more inveteracy than do Sinhalese. The Registrar-General's figures for Ceylon in 1921, though "obviously incorrect," give buccal cancer 163, cancer of the digestive system 137, uterus 20, breast 13, other organs 97. The latent period may be short or very long. Buccal cancer is very fatal and after removal invariably recurs. The ingredients of the "chew" seem not to differ from the Siamese.

Dr. A. LEITCH reports on a specimen of buccal cancer received from Dr. Spittel.

[On this subject ELLIS should be consulted, this *Bulletin*, Vol. 20, p. 56.]

A. G. B.

RABELLO (Eduardo). **Sur la prophylaxie du Cancer au Brésil.**—*Bull. de l'Assoc. Française pour l'étude du Cancer.* 1923. June. Year 16. Vol. 12. No. 6. pp. 463–466.

Cancer, though not one of the grave sanitary problems of Brazil, is on the increase, especially in the temperate parts of the country, but it is here that the foreign element is densest. The Federal Government has created a bureau for its control of which the writer is Director. There are at present three institutes where the disease is studied and treated, at Rio de Janeiro, at Sao Paulo, and in the State of Minas Geraes. [See DA COSTA, above, p. 309.] A new Institute, for which a generous donor has given 5,000,000 francs, is to be erected at Rio and named after Oswaldo CRUZ, the great Brazilian hygienist.

A. G. B.

WOODCOCK (H. M.). **A Modification of Dr. Charles Creighton's View of Malignant Growths.**—*Jl. Roy. Army Med. Corps.* 1923. Oct. Vol. 41. No. 4. pp. 241-268. With 16 figs. [14 refs.]

The author's speculations on "haematophagy" as a complete and natural process, and also as an imperfect and pathological process, have been noticed in this *Bulletin* (Vol. 19, p. 620, and Vol. 20, pp. 676 and 677), and are now embodied in a theory of malignant growths, of which we here can give but the outline.

The author reminds us (1) That the tissue-cell, howsoever subordinated and specialized, retains its individuality and its primordial capability—latent, or fully potent—of ingesting and digesting solids,—a valuable reminder. (2) That many tissue-cells do ingest and digest solids, particularly red blood corpuscles, this physiological haematophagy—which he now distinguishes as "haemetaboly"—being exemplified in the phagocytosis of red blood corpuscles by macrophages, in the destruction of red blood corpuscles by certain liver cells, in the manufacture of colloid matter by the thyroid gland (extracellular), in the formation of pigment by epithelial cells, and in the proliferation of the epithelium of the mammary gland in the early stages of pregnancy. This form of haematophagy is a normal process,—the specialized tissue-cell ingests and assimilates its quantum of blood corpuscles not for itself alone, but for the good of the organism as an inclusive whole.

But, in circumstances as inscrutable as the origin of life itself, a tissue-cell may become insubordinate and [like the seditionist who understands no difference between the unlicensed rights of the jungle and the limited rights of the civilized man] may seize all it can get, for its own use, without any concern for its incorporate obligations. Such a cell is the cancer cell—a disordered tissue-cell that feeds on blood corpuscles, having "become able to produce of itself an all-powerful digestive enzyme independently of outside influence or control; and this inherent capacity is transmitted to its descendants in cell division." Unless, of course, as in the case of a true endothelioma, it is, as CREIGHTON taught, a cell of the vascular tissue.

What starts the cell on its malignant chaotic course is a mystery, which, however, seems for its manifestation to depend upon iron. Growth and multiplication cannot occur without chromatin, and chromatin depends on iron. If a cell ingests iron (haemoglobin or chromatin) then in the absence of control, proliferation may be expected as the final result.

A. A.

BAUJEAN (R.). **Alastrim et Variole.**—*Bull. Soc. Path. Exot.* 1923. Nov. 14. Vol. 16. No. 9. pp. 676–692. With 2 plates & 4 charts. [10 refs.]

An account is given of an epidemic of alastrim in Martinique in its clinical, microscopical and experimental, and immunological aspects. It is noted that the vesicles remained rounded instead of becoming flat and were never umbilicated either in this or in the pustule stage. If there were depressed scars, and this was unusual, they were not permanent. Like other observers, he remarked the satisfactory general state of the patients, even when they were covered with pustules, but there were exceptions. In several thousands of patients the mortality did not exceed 1·5 per cent.; however, a few vigorous subjects succumbed.

Inoculations of the vesico-pustule contents made into calf, monkey, rabbit, and guineapig, whether by pricks or scarification, gave no positive result, beyond a transitory reaction in a spider monkey [*cf.* MACCULLUM and MOODY, this *Bulletin,* Vol. 19, p. 438, but LEAKE and FORCE seem to have been more successful, *l.c.* Vol. 18, p. 293]. Of rabbits inoculated on the shaven skin but presenting no alastrim eruption which were afterwards vaccinated some were refractory, others "had a vaccinal eruption" [*cf.* LEAKE and FORCE, *loc. cit.*]. He failed to immunize four rabbits against vaccinia by inoculation with the serum of convalescents. If 40 per cent. may be regarded as normal for all varieties of mononuclears there was some degree of mononucleosis; this is regarded as a character of variola. Paul's reaction was tested with the vesico-pustules, at various stages, of 15 patients, always with a negative result.

It was shown that alastrim and vaccinia confer immunity on one another. 72 patients unvaccinated, or not for many years, were vaccinated in the course or at the close of an attack; in four there was a slight take and in 68 no result at all. The other way there was plenty of evidence. All or almost all the alastrim patients had never been vaccinated, or not revaccinated with success. When some members of a family had been vaccinated and others not, alastrim respected those but attacked these. In a ward of the civil hospital where a case occurred, the other patients, about 30, were vaccinated, but one was overlooked. This patient alone contracted alastrim. No cases occurred among the personnel in the hospital, or the Institute of Hygiene, or in the schools (4,000 children), all protected by recent vaccination.

It is incontestable, the author writes, that vaccination has protected against alastrim and has been the best means of prophylaxis. This is, he thinks, a very strong presumption in favour of the identity of alastrim and smallpox, but irrefragable proof is still wanting.

A. G. B.

i. HILL (H. W.). **Report on an Outbreak of Alastrim in Antigua, B.W.I.**—*Canadian Med. Assoc. Jl.* 1924. Jan. Vol. 14. No. 1. pp. 44–45.

ii. BRANCH (E. Wm. R.) & MCDONALD (W. M.). **Report of an Outbreak of Alastrim in Antigua.**—*Ibid.* p. 45.

i. "Clinically, alastrim, amaas, Kaffirpox, Cuban itch, Sanaga pox, glass pox, milk pox, and mild smallpox are indistinguishable; they are all prevented by vaccination, and hence (since vaccinia is smallpox, modified by the cow) show the essential biological as well as practical test for etiological identity with smallpox." .... "Every item of proof so far accumulated indicates that the 'alastrim' of the tropics is merely the mild smallpox of the temperate zone under another name; a name it would be well to abandon, lest the mere existence of a separate name foster a mistaken belief in a separate etiological entity to correspond with it."

ii. Alastrim was first found in Antigua on January 22nd, 1923. Infection was traced to the wife of a police constable who had come from Dominica on December 2nd with a certificate of successful vaccination, though no marks of recent vaccination were seen. In two instances, out of some 30, the incubation period was 17 days, so that the authors would have the period of quarantine or surveillance extended from 14 to 21 days. Stringent measures were taken, including revaccination, and clean bills of health were issued on April 6th.

A. G. B.

SCOTT (Joseph M.) & SIMON (Charles E.). **The Diagnosis of Smallpox by the Paul Method.**—*Amer. Jl. Hyg.* Baltimore. 1923. July. Vol. 3. No. 4. pp. 401–415. With 2 plates. [17 refs.]

The PAUL method of diagnosis of smallpox, an account of which was given in this *Bulletin*, Vol. 19, p. 440, is here described and discussed in all essential detail, with excellent figures (reproduced). Briefly, it consists in inoculation of the rabbit's cornea with variolous material, the sacrifice of the animal after 48 hours, and the examination of its cornea in sublimate alcohol with the naked eye and in sections passing through the lesions.

The authors conclude that when controlled by histological examination the reaction constitutes a most valuable method for the diagnosis of smallpox, that in many cases the macroscopic picture of the cornea in the sublimate bath is sufficient for diagnosis, that a negative result will in most cases exclude smallpox, that pyogenic infection of the skin may produce a picture which macroscopically could be mistaken for positive, but that the histological appearances will correct this impression, that in varicella negative results are so constant that a doubtful reaction should arouse suspicion and lead to re-examination of the patient.

Paul's method, we learn, is now used as a matter of routine in various public health laboratories both in Germany and Austria.

For the technique, the paper or at least the extracts already made (*loc. cit.*) must be consulted.

The appearance of variola-infected and non-infected cornea after treatment with sublimate alcohol is thus described:—

"When the normal control eye is placed in the sublimate bath, it will be noted that the cornea becomes evenly opaque, with the exception of faint lines which occasionally are visible and represent the scratches, made during scarification. Occasionally, though exceptionally, the background assumes a mottled appearance at first, but this gradually changes to a uniform opacity (fig. 1).

"*A variola-infected cornea* presents an entirely different appearance. The general background has also become milky white, but here and there within the scarified area *intensely white and opaque* little elevations make their appearance, some of which, already at this time, present a distinctly visible, dark little crater, in the centre of the elevation. This picture is pathognomonic of a variola infection. It is never seen after inoculation of varicellar material and is very different from the picture presented by a purulent process (figs. 2, 3 and 4).

" The number of little elevations is variable. Sometimes one sees only three or four, while at other times two dozen or more may be discernible. Usually they are discrete and then circular in outline, with very clear cut margins. At other times they show a tendency to become confluent. Diffuse changes, however, do not belong to the variola picture."

Sections should be examined as a matter of routine unless the observer has already gained much experience. They show that the hummocks are the result of an increase in the size of the epithelial cells due to the imbibition of fluid, and that the crater-like changes are the result of desquamation (figs. 5 and 6).

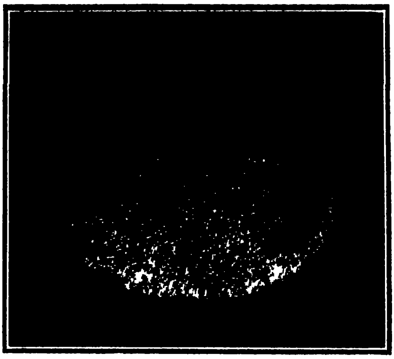

FIG. 1 —Appearance of a normal eye in the sublimate bath, forty-eight hours following scarification. The same picture will be obtained in the case of an eye that has been inoculated with the contents of varicellar vesicles (magnification of about five diameters).

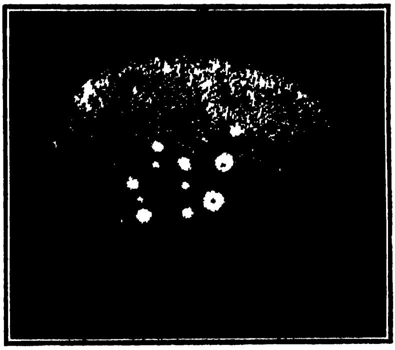

FIG. 2.—Appearance of a variolated eye in the sublimate bath, forty-eight hours after inoculation. Note the little hummocks, some of them showing beginning crater formation (same magnification).

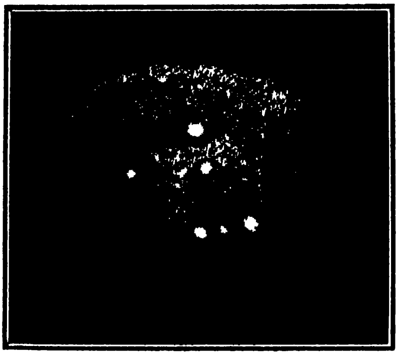

FIG. 3.—Appearance of an eye in the sublimate bath, forty-eight hours after inoculation with a mixture of variolar material and a pure culture of Streptococcus erysipelatosus; a few isolated hummocks can be detected in the diffusely opaque degenerated zone (same magnification).

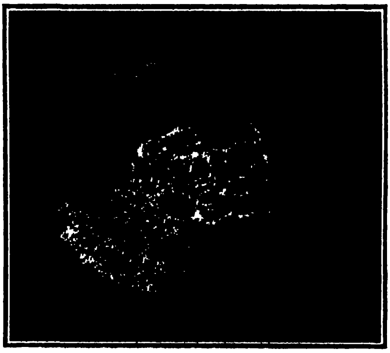

FIG. 4.—Appearance of an eye in the sublimate bath, forty-eight hours following inoculation with a pure culture of Streptococcus erysipelatosus; note the absence of individual hummocks and the diffuse character of the destructive lesions (same magnification).

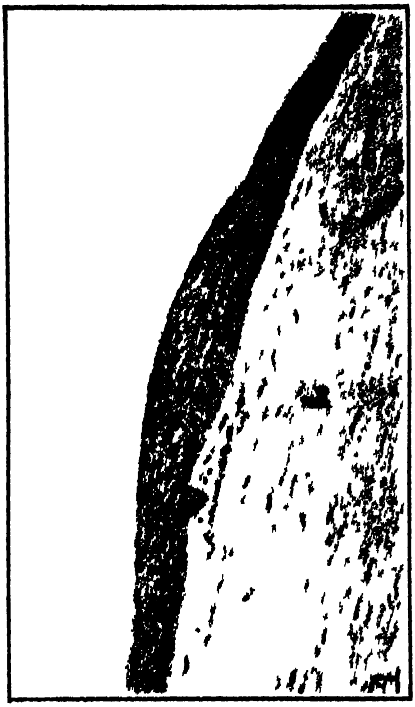

FIG 5—Section showing a typical epithelial hummock under the low power (Objective 16 mm, ocular 10)

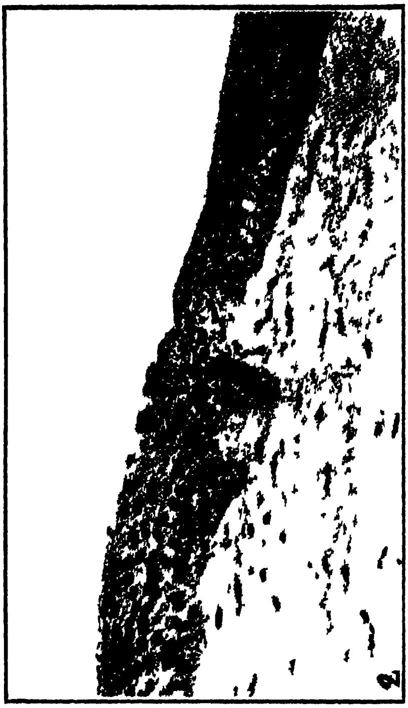

FIG 6—Section through an epithelial hummock with beginning crater formation, note the irregular position of the epithelial cells and the presence of Guarnieri bodies in many of them (Objective 4 mm ocular 10)

[Figs 1 to 6 are reproduced from the *American Journal of Hygiene*]

The method was tested on 104 rabbits' eyes, of which 36 were normal controls 14 were inoculated with cowpox vaccine, 18 with the contents of smallpox pustules and vesicles, and 8 with the contents of varicella vesicles, and various forms of herpes, pemphigus, dermatitis herpetiformis, ringworm, cultures of pyogenic organisms, nasopharyngeal swabbings, were similarly tested As is shown in a table, the variola (4th–8th day) and vaccinia cases were all positive, varicella and the rest all negative It is well to dilute vaccine virus (1 1,000), if of recent date

A G B.

HOFFMANN (W H). **Blood Studies in Smallpox, with Special Reference to Alastrim.**—*Jl Trop Med & Hyg* 1923 June 15 Vol 26. No 12 pp 217–219

The author has studied for three years in Cuba an epidemic of mild smallpox. All the cases were isolated for 40 days, during which he made about 300 blood observations His results were as follows —

"(1) The blood in smallpox shows very marked changes in total number and in relative distribution of white cells—namely, very high leucocytosis

beginning from the fourth day, unusually high eosinophilia, very marked relative lymphocytosis, presence of myelocytes, initially high Arneth index.

" (2) Only in chicken-pox a similar differential count is observed; but the differential diagnosis in this case is very easy because of the absence of leucocytosis in chicken-pox.

" (3) The changes are still very marked at the end of the sixth week, and probably longer; this makes possible a retrospective diagnosis even after clinical recovery."

There is a leucopenia for the first three days, during the prodromal symptoms, but on the fourth day the number of leucocytes rises rapidly, with averages of 17,000 from the ninth to the fourteenth day. The count remains high during the third week and has not returned to normal at the end of the sixth week. The percentage of polymorphs remains below the normal. The increase of eosinophiles is one of the characteristic symptoms: 3–10 in the first three weeks, it increases from the eighteenth day to 15–20 per cent., and this high percentage is often still present at the end of the sixth week. The author thinks that the eosinophiles are of great importance for the curative processes and for the development of immunity. The lymphocytes are above the normal after the first week. The large mononuclears are increased to 4–8 per cent. Myelocytes " are scarcely ever missed " in smallpox; they form 1–3 per cent. or more. The Arneth index is up to 90 in the first week, and later approaches the normal.

The author writes that these blood tests " cannot be recommended enough for clinical purposes of diagnosis in infectious diseases." The total number of leucocytes and of eight varieties and the Arneth index are tabulated for each of the 40 days. He suggests that studies of this kind may throw light on the " alastrim question."

A. G. B.

HOFFMANN (W. H.). **Diagnostico diferencial de la viruela y la varicela por la sangre.** [Blood Examination in the Differentiation of Variola from Varicella.]—*San. y Benefic. Bol. Ofic.* 1922. Sept.-Dec. Vol. 27. Nos. 9, 10, 11 & 12. pp. 465–479. With 8 charts.

——— **Comparative Blood Studies in Smallpox and Chickenpox.**—*New York Med. Jl. & Med. Rec.* 1923. Nov. 21. Vol. 118. No. 10. (Whole No. 2269.) pp. 616–618. With 5 text figs. [1 ref.]

Of late years smallpox appears as a comparatively mild disease, but a mild case may give rise to severer forms. Professor Hoffmann (Havana) has made blood examinations at all stages of smallpox and of chickenpox with a view to finding a method of differentiating them. Sixty variola patients were under observation for 40 days and 40 varicella patients for 20 days. The following table has been compiled from the statements diffused through the text to show the differences between the findings in the two conditions. It will be seen that the high leucocyte total is not due to the pustulation and relative increase of polymorphonuclears, which remain below the normal throughout.

Leucocyte counts in Variola and Varicella.

	Period of Disease.	*Variola.*	*Varicella.*
Total Leucocytes per cmm.	Third to sixth day	4,000—6,000	3,000—7,000
	Seventh to ninth day	17,000	10,000—12,000
	Tenth to fourteenth day	17,000—30,000	Falling to normal or even lower to 4,000
	Twenty-first day	12,000—24,000	
	Twenty-second to fortieth day	Gradual return to between 9,000 and 12,000.	
Polymorphonuclears.	First to sixth day	20—30%	15—30%
	Fourteenth to twenty-first	45%	30—45%
	Twenty-second to forty-second	30—40%	..
	Arneth Index	90	..
Eosinophiles	First to twenty-first day	3—10%	Normal first week, 4—10% second and third weeks.
	Third to sixth week	15—20 (perhaps 30)%	
Lymphocytes.	First week	45%	75%
	Third week	65%	Third to sixth weeks average 30—50%
	Fourth to sixth week	40—50%	

H. Harold Scott.

CUNNINGHAM (J.) & CRUICKSHANK (J. A.). **A Note on the Effect of Intravenous Injections of Antimony Tartrate upon the Development of Vaccinia Virus.**—*Indian Med. Gaz.* 1923. Sept. Vol. 58. No. 9. pp. 427–428.

SAMI SABONGY Bey, having in BYAM & ARCHIBALD'S " Practice of Medicine in the Tropics " recorded the results of treatment of non-haemorrhagic smallpox by intravenous injections of antimony tartrate as " promising," the authors tested its effect on the development of vaccinia in the calf. Five calves and five controls were thus treated under experimental conditions, with the result that the development of vaccinia was unaffected. " It is therefore more than likely that it [potassium antimony tartrate] has little or no effect upon the development of the virus of variola in the human subject."

A. G. B.

REID (G. Archdall). **Small-Pox, the Vaccination Propaganda, and Malaria.** [Correspondence.]—*Brit. Med. Jl.* 1923. Aug. 11. p. 261.

In 1921 Sir Archdall Reid recommended the administration of a powder containing aspirin gr. x, pulv. ipecac. co. gr. v, and phenacetin gr. v in acute toxaemia. He believes that the toxins of disease are largely eliminated in the sweat, that the toxins paralyse the sweat centre and so prevent their own elimination and that the medicine deparalyses it ; he finds that the beneficial effect is usually accompanied by sweating. He here writes that the treatment aborts vaccinia ; he believes that it would abort or at least mitigate the severity of smallpox ; and he suggests its trial at the earliest hint of the hot stage in malaria. He thinks that it would end that stage quickly and leave the merozoites en route to invade fresh corpuscles defenceless. Quinine would be employed at the same time.

A. G. B.

REMLINGER (P.). **L'éléphantiasis au Maroc.**—*Bull. Soc. Path. Exot.* 1923. June 13. Vol. 16. No. 6. pp. 422–425. [2 refs.]

The fairly frequent occurrence of elephantiasis in Morocco, over which country it is generally spread, is contrasted with its rarity in Algeria and Tunis. Its incidence is almost equal in Mussulmans and Jews; it begins as a rule between ages 20 and 30, is more frequent in men than women, and attacks almost exclusively the scrotum and lower limbs, in which in a third of the cases it is double. Clinically it corresponds to the description in the text-books. The glands of the hypertrophied area are nearly always free. The leucocyte formula is near the normal and there is never eosinophilia. Search for microfilariae by night and by day has never had success. A diplococcus or tetracoccus can be grown from the serum which exudes when the skin is pricked, but as the author can grow it from the skin of healthy subjects he thinks little of it. It stains by Gram and is probably a staphylococcus. A streptococcus may be causative, but often cannot be demonstrated. It is doubtful whether the disease is inoculated through the skin, for it is equally common in town and country, in the barefooted and in shoe wearers. Itch is frequent in Morocco, but seems never to be the precursor of elephantiasis. In fact the etiology is a mystery. The affected parts may reach a great size, but the prognosis is good. Some cases have been followed for 12 years. Sometimes there is improvement—spontaneous and not due to treatment. The only patient who consented to operation, a scrotal case, succumbed to septicaemia in a week. This was a streptococcus case.

A. G. B.

DEKESTER & MARTIN (J. M.). **L'éléphantiasis dans la région de Fez (Maroc).**—*Bull. Soc. Path. Exot.* 1923. July 11. Vol. 16. No. 7. pp. 494–496.

Five cases of elephantiasis, four males and one female, have been met with at the hospital at Fez during the years 1920-23. None of the patients had ever been away from Morocco. No filarial embryos were found in any although repeated examinations were carried out, nor have the authors ever seen a case of filariasis among Moroccans (but the disease exists at Fez among immigrant Senegalese). They are of opinion that all five cases were of microbial origin with secondary chronic inflammation rather than filarial.

H. Harold Scott.

WALLER (H. W. L.). **The Operation for Elephantiasis Scroti.**—*Lancet.* 1923. Nov. 24. pp. 1132–1133.

The author describes an operation which he has practised in Zanzibar with successful results for the last six years. His procedure is said to be a modification and simplification of a method introduced in America by FAUNTLEROY. With the patient in the lithotomy position, a simple double-bar screw clamp, which can be tightened or loosened at will, is applied to the neck of the tumour as close to the trunk as possible. A horse-shoe shaped incision is then made in the upper and anterior part of the tumour, the vertical limbs of this incision starting two inches to right and to left of the middle line just below the clamp, curving to meet each other immediately below the preputial orifice, and inclosing a flap 4 to 4½ inches wide. The remainder of the tumour is encircled by an incision which extends at right angles from the centre of one vertical limb of the horse-shoe to the other round the posterior aspect of the scrotum. The horse-shoe flap, with its contained penis, is then raised, and a small segment of its lower margin sacrificed by dividing the preputial tissues transversely about one inch distal to the glans penis. The inner lining of the prepuce is preserved, and the flap having been freed from elephantoid tissue is wrapped with the penis in gauze and thrown back on to the abdomen. Testes and cords are then sought for, dissected out, protected with gauze and temporarily disposed of in the same way. If hydroceles are present, and such is nearly always the case, the tunicae are either excised or everted. The large mass of the tumour is now removed, the clamp loosened and complete haemostasis secured. From the skin which has been left behind and subsequently freed "as far as possible" from diseased tissue, the clamp having been withdrawn, a pocket of sufficient size to hold the testes and cords is fashioned and sutured. The penis is enveloped in the horse-shoe flap, which is stitched below along the line of the absent raphe and joined anteriorly to the cut edge of the prepuce.

The author notes that recovery is rapid even in the absence of complete asepsis, that potency is as a rule regained, and that the mortality is nil.

[Most surgeons with experience of elephantiasis of the scrotum appear to devise methods of operation either wholly or in part their own. The procedure described doubtless answers well in cases where there is a sufficiency of healthy skin for covering purposes.]

J. J. Pratt.

DINGUIZLI. **La pratique de l'obstétrique chez les populations indigènes de Tunisie.** -*Bull. Acad. Méd.* Paris. 1923. July 31. Year 87. 3rd Ser. Vol. 90. No. 31. pp. 120–122.

HOFFMANN (W. H.). **Linfogranulomatosis Venerea.**—*San. y Benefic. Bol. Ofic.* 1922. July-Aug Vol 27. Nos. 7 & 8. pp. 387–390. [See this *Bulletin,* 1923, Vol. 20, p. 666.]

HUNT (D.). **Samoan Medicines and Practices.**- -*U.S. Nav. Med. Bull.* 1923. Aug. Vol. 19. No. 2. pp. 145–152. With 2 figs.

MUKHERJEE (Phani Bhusan). **Intravenous Iodine in the Treatment of Septic Wounds.**—*Indian Med. Gaz.* 1923. Nov. Vol. 58. No. 11. pp. 537–538.

RICOU (M.). **Extraction par simple expression d'un gros calcul salivaire de la glande sublinguale.**—*Bull. Soc. Path. Exot.* 1923. Oct. 10. Vol. 16. No. 8. p. 601.

TROPICAL DISEASES BUREAU.

TROPICAL DISEASES BULLETIN.

Vol. 21.] 1924. [No. 5.

AMOEBIASIS AND DYSENTERY.

AMOEBIASIS.

VENDEUVRE. **L'amibiase pulmonaire pure sans abcès du foie. Traitement et guérison par l'emétine.**—*Maroc-Médical.* 1923. Aug. 15 & Sept. 15. Nos. 20 & 21. pp. 233-238; 259-263. With 3 figs. [1 ref.]

After perusal of the communication from RAMOND, DENOYELLE, and LAUTMAN (see this *Bulletin*, Vol. 20, p. 708), the author remembered having treated a similar case about a year previously, of which an account is here given :—

The patient was admitted to hospital on account of haemoptysis, together with a high remittent temperature. The sputum was mucopurulent and streaked with blood. The pulmonary signs were limited to the right lung and denoted bronchopneumonic patches, with subcrepitous râles. The vocal tremitus was increased, the pulmonary pain was exaggerated by movement, and was referred to the intercostal spaces at the right base ; the left lung appeared to be normal. The provisional diagnosis of pulmonary tuberculosis was made. The radiograph of the lungs was interesting, and showed numerous opaque patches, especially at the right base, the hilum and the apex of the right lung. There were two smaller patches on the edges of the left lung. The possibility of pulmonary amoebiasis was not at that time suspected, but emetine was given on account of the haemoptysis, and the patient made a remarkable recovery. A 10 days' course was given. The author now thinks that the broncho-pneumonic patches were caused by infiltrations with the amoeba

The remainder of the paper is concerned mainly with a résumé of the literature on this subject, with especial reference to the differential diagnosis. There were no other original observations.

P. H. Manson-Bahr.

PANAYOTATOU (Angélique). **L'amibiase primitive des bronches chez les enfants en Egypte.**—*Bull. Acad. Méd.* 1923. Nov. 6. Year 87. 3rd Ser. Vol. 90. No. 37. pp. 305-309.

This paper refers to the articles of PETZETAKIS [see this *Bulletin*, Vol. 21, p. 22]. The author gives details of 11 cases ranging from 2½ to 14 years of age. The sputum was mucous or blood-stained, and the amoebae, living, dead, or in cystic form, were found in every one. Four had suffered from a dysenteric attack some time previous to the bronchitic symptoms, three had dysentery and bronchitis

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simultaneously, while in three others the bronchitic lesion was primary. One case had enlarged glands. The most prominent symptom was a loud and remarkably persistent cough ; on auscultation moist râles could be heard at both bases. Treatment consisted of a course of emetine lasting 13–18 days.

The sputum is infective apparently for cats : one kitten fed on sputum containing numerous cysts developed dysentery three days afterwards, and died on the 8th day. At autopsy numerous ulcers containing active amoebae were found in the intestine. Two other cats were injected intrarectally with sputum and developed dysentery on the second and third days. One died on the 15th, the other on the 16th day, with similar lesions.

P. H. M-B.

PETZETAKIS. **Bronchites amibiennes (nouveaux cas) avec présence d'amibes vivantes dans les crachats sans abcès des poumons et du foie. (2e série des observations de broncho-amibiase.)**—*Bull. et Mém. Soc. Méd. Hôpit. de Paris.* 1923. Nov. 8. Year 39. 3rd Ser. Vol. 47. No. 31. pp. 1431–1447. With 7 figs. [3 refs.]

The author's first paper was reviewed in this *Bulletin* (Vol. 21, p. 22). He thinks that his cases of amoebic bronchitis are quite distinct from those usually described under the heading of pulmonary amoebiasis, for in the latter cases a history of dysentery or liver abscess has preceded the pulmonary symptoms, such as in those recently described by RAMOND, DENOYELLE and LAUTMAN, and also by the reviewer (*loc. cit.*, Vol. 20, p. 708 ; Vol. 21, p. 22). On this occasion he figures amoebae containing red blood corpuscles seen in the living state in the sputum. [These are only rough figures, the pseudopodia are sharp and talon-like, and in this respect differ markedly from what is usually observed in these protozoa.] To see the amoebae successfully the sputum should be examined directly it has been voided. The morphology of the organisms resembles that of *E. histolytica* more than anything else, and certain forms he thinks represent precystic individuals. When emetine treatment has been instituted the movements of the amoebae become less marked and cysts of a variable size, with 2, 3 and 4 nuclei, begin to appear. The sputum in these cases is viscid, mucous and sometimes blood-stained. It contains, besides the amoebae, large numbers of epithelioid cells and flattened epithelial cells derived from the bronchi. A certain number of the cases have a definite leucocytosis. The details of 10 cases are given. The differential diagnosis between this condition, tuberculosis, pulmonary hydatid and bronchospirochaetosis is discussed.

P. H. M-B.

PETZETAKIS. **Présence fréquente d'amibes vivantes dans les crachats et les urines au cours de la dysenterie amibienne aiguë. La " cystite amibienne."**—*Bull. et Mém. Soc. Méd. Hôpit. de Paris.* 1923. Dec. 13. Year 39. 3rd Ser. Vol. 47. No. 36. pp. 1681–1693. [2 refs.]

The author reiterates his conviction that the amoebae found in the sputum in his cases of amoebic bronchitis are none other than *Entamoeba histolytica.* The question of antecedent dysentery has been specially investigated in the present paper. Latterly, he has examined the sputum of 34 acute amoebic dysentery cases and at the same time, in the more urgent ones, the urine. In three cases he found amoebae both in sputum and in urine, in two in sputum alone, and in one acute cystitis with amoebae in the urine; that is, 14 per cent. of dysenterics harbour *E. histolytica* in the sputum.

The claim is made that in these cases an initial amoebic septicaemia occurs, in fact, a generalized infection, and that the liver and lung may be invaded some considerable time before the onset of dysentery.

P. H. M-B.

DOWLING (George A.). **Amebic Infection in the State of Washington.**—*Jl. Amer. Med. Assoc.* 1923. Nov. 17. Vol. 81. No. 20. pp. 1657–1660.

Amoebic dysentery apparently exists in considerable amount in the region of Seattle (north-west coast of America). In this paper, 30 cases are recorded as recognised during a study of 13,000 patients seeking hospital treatment. 16 were in men, 14 in women. All but seven were native Americans. In seven instances the infection was contracted abroad. The primary complaint was usually indigestion or diarrhoea; most were of long-standing infection; the shortest history was two months.

Treatment with emetine and ipecacuanha has been discarded, as neuritic symptoms followed the former, and the patients were incompletely cured. Since changing to emetine bismuth iodide treatment no failures have been recorded. No evidence connecting the presence of Orientals with the spread of infection was secured.

P. H. M-B.

WRIGHT (Harold W.). **Chronic Intestinal Amebiasis: Clinical Aspects with Special Reference to Neuropsychiatric Manifestations.**—*Arch. of Neurol. & Psychiatry.* Chicago. 1923. Aug. Vol. 10. No. 2. pp. 226–231.

The author gives a summary in tabular form of 25 cases of mental disease associated with intestinal amoebiasis. The syndromes of the association were as follows: Neurasthenic syndrome with mental depression; toxic syndrome with myocardial irritability simulating hyperthyroidism; polyneuritic syndrome; arthritic syndrome with reflex nerve pains and deposits in foramina of the vertebrae. All presented gastro-intestinal symptoms with occasional diarrhoea. Several improved after treatment by ipecacuanha, and the author thinks that he is warranted in calling attention to intestinal amoebiasis as a factor in chronic neurasthenia.

P. H. M-B.

SIMON (Sidney K.). **Intestinal Infection with** *Entamoeba histolytica* **as a Factor in Arthritis Deformans.**—*New Orleans Med. & Surg. Jl.* 1923. Nov. Vol. 76. No. 5. pp. 243–245. [4 refs.]

The discovery of *Entamoeba histolytica* in the necrosed bone of arthritis deformans has opened up a new conception of this disease, but the clinical correlation between arthritis and amoebic dysentery has not been generally recognized, though the association between this complication and bacillary dysentery is well known. The route by which *E. histolytica* travels from the gut to the bone is still a matter of speculation. An account of a clinical case of arthritis deformans complicated by an intractable type of dysentery, with the presence of active *E. histolytica* in the faeces, is related. The patient has extensive rheumatoid arthritis, as well as dysenteric symptoms. A prolonged course of ipecacuanha treatment in no way improved his joint condition, but greatly relieved his dysenteric symptoms, though he still continued to pass blood and mucus.

P. H. M-B.

CANNATA (S.). **Contributo alla conoscenza dell' amebiasi nell' età infantile.** [Amoebiasis in Children.]—*Pediatria.* 1923. Nov. 15. Vol. 31. No. 22. pp. 1193–1197. [4 refs.]

Cases of amoebic dysentery continue to be reported from Italy, Sicily and Sardinia. Whether these are due to the spread of the disease by those returned from the war, or whether more thorough examination of the faeces by those who gained experience in the war, has led to the more frequent diagnosis of a condition which existed previously, it is difficult to say. In the present paper six more cases are recorded, the ages of the patients varying from 14 months to 9 years. Five of them were acute and one a chronic case. Most did well with emetine injections (½–1 cgm for a dose according to age) followed by emetine-bismuth-iodide. One patient proved intolerant of the latter ; amaurotic symptoms appeared after six days' treatment but passed off when the drug was stopped.

H. Harold Scott.

HEYMANN (P.). [**De la valeur du pneumopéritoine dans le diagnostic des abcès du foie.**]—*Arch. d'électric. Med.* 1923. Vol. 31. pp. 358–375. [Summarized in *Méd. Sci. Abstr. & Rev.* 1924. Mar. Vol. 9. No. 6. p. 520.]

The method of pumping air into the peritoneal cavity enables abdominal viscera to be radiographed with considerably greater success than was formerly the case. It is without danger to the patient, and is especially valuable in the diagnosis of liver abscess as it renders peripheral as well as centrally-placed abscesses visible, while the dimensions and presence or absence of adhesions become discernible.

P. H. M-B.

SCALAS (Luigi). **L'intradermoreazione nella dissenterica amebica.** [The Intradermal Reaction in Amoebic Dysentery.]—*Riforma Med.* 1923. Oct. 8. Vol. 39. No. 41. pp. 967–969.

The antigen used by the author for this test is prepared as follows : 30 gm. of mucus and small fragments of intestinal mucosa from the fresh faeces of a case of acute amoebic dysentery are treated with 30 cc. of normal saline in a stoppered vessel containing glass beads and placed in a thermostat at 37° C. for a week with daily shaking. The product is then filtered, first through paper and afterwards through a Berkefeld filter connected with an exhaust pump. The filtrate is decolorized with animal charcoal and sterilized. For the test 0·25 cc. is injected intracutaneously. A positive result is shown by a swelling on a large red base, 5–6 cm. in diameter, appearing in an hour with itching and a sense of heat but no actual pain. The signs all fade in one to three days. In negative cases there is merely an erythema, no oedema, local heat or discomfort.

Brief notes are given of 9 cases, including patients in the acute, subacute and chronic stages of amoebic dysentery, in all of whom the test proved positive; also of 23 others, 5 healthy subjects, 7 patients suffering from non-amoebic entero-colitis, and 11 with various other diseases. All these were negative.

H. Harold Scott.

LAFONT (A.). **Formules et numérations leucocytaires aux colonies. Leur importance pour le diagnostic des suppurations profondes et particulièrement des abcès du foie.**—*Bull. Soc. Path Exot.* 1923. Nov. 14. Vol. 16. No. 9. pp. 693–701. [1 ref.]

This is a personal reminiscence, the result of 28 years spent in the tropics, of the diagnostic value of the leucocyte count. Every medical officer posted to the Colonies should make himself familiar with the technique of this simple test. The differential diagnosis between abscess and gumma of the liver may be settled by its means. The author records that in 539 autopsies performed by SEGUIN from 1897–1911, the death rate from hepatic and intestinal amoebiasis was 50 per cent.

P. H. M-B.

ACHITOUV (E.). **Amibiase chronique à forme d'entérocolite fétide; trichomonase et spirochétose secondaires.**—*Rev. Prat. Malad. des Pays Chauds.* 1923. Dec. Year 2. Vol. 3. No. 4. pp. 275–281.

This paper is founded upon a single case of intestinal amoebiasis. In the initial stages the symptoms resembled those of appendicitis; dysenteric symptoms appeared later, but diagnosis was rendered difficult by the scarcity of entamoebae in the faeces and the abundance of trichomonas and spirochaetes.

The stools were foetid; the administration of anthelminthics resulted in the expulsion of 15 ascarids. The patient made a good recovery on Ravaut's paste combined with intravenous injections of 0·6 gm. salvarsan. The author believes that the amoebae were resistant to emetine, and that the ulceration of the bowel was partly due to the spirochaetes and intestinal flagellates; hence the value of salvarsan.

P. H. M-B.

OLIVER (T. H.). **Experiences in the Treatment of Amoebic Dysentery during the War.**—*Jl. State Med.* 1924. Jan. Vol. 32. No. 1. pp. 34–37.

This paper is based on the records of 292 cases of amoebic dysentery observed at Basra. The patients on admission, after microscopic diagnosis, were given a mixture containing 3 drachms of magnesium sulphate to the ounce, and emetine daily, with a morning saline aperient, 1 grain hypodermically and ½ grain by the mouth for 12 days. 78 per cent. of cases still showed cysts in their faeces after this treatment. Allowing for error through the limited number of stool examinations, emetine *per se* must be looked upon as a total failure in eradicating the disease. The presence of complicating malaria proved a difficulty, and the task of eradicating dysentery in a patient debilitated by malaria appeared almost hopeless. The presence of mixed infections with *B. dysenteriae*, which was present in 21 cases, also complicated matters.

From statistical tables the author was led to infer that emetine treatment was more successful in the warmer weather; the failures to cure are recorded as 63 per cent. from October to March and as 22 per cent. from April to August. It is possible that the entamoeba becomes more readily formed into cysts in the cooler weather and so more resistant to emetine. The period during which emetine appeared to be most inefficient corresponded with the maximum incidence of bacillary dysentery in the months of July to September.

The combination of emetine with an intestinal antiseptic, such as salol, appeared to be advantageous. Salol 10 grains was dissolved in 3 drachms of liquid paraffin, 60–80 grains of the former drug were given daily for one week, and after this treatment of 53 uncomplicated cases of amoebic dysentery, 11·2 per cent. continued to pass cysts. Emetine bismuth iodide was given in 8 cases, and of these 6 continued to pass cysts.

P. H. M-B.

PETZETAKIS. **Avantages des injections intraveineuses d'émétine dans le traitement de la dysenterie amibienne aiguë ou chronique et des amibiases viscérales.**—*Bull. et Mém. Soc. Méd. des Hôpit de Paris.* 1924. Mar. 6. Year 40. Vol. 48. 3rd Ser. No. 8. pp. 263–270. [2 refs.]

Intravenous injections of emetine are here advocated. In chronic or moderately severe cases the following doses are employed:—

First day	0·03–0·05 gm.
Second day	0·05–0·06 ,,
Third day	*idem*
Fourth day	0·06–0·1 ,,
Fifth to seventh day	0·05–0·06 ,,
Tenth day	*idem*

or 0·35–0·45 gm. emetine within 10 days.

In serious cases slightly larger doses up to 0·6 gm. in the same period are employed. The injections are made at the bend of the elbow. The results are rapid and striking and are much superior to those of the intramuscular or subcutaneous methods usually employed. In the chronic forms and in visceral amoebiasis this method has given better results than any other and certainly prevents relapse.

In a general way the author thinks that the life history of the entamoeba in the human body is little understood and that different species are capable of producing the dysenteric syndrome. At the commencement of the disease the organisms may enter the circulation, thus necessitating intravenous treatment at this stage.

The emetine treatment of amoebiasis should be based on the same principles as obtain in visceral syphilis.

P. H. M-B.

NORMET. **Les traitements pratiques. La dysenterie amibienne.**—*Ann. de Méd. et de Pharm. Colon.* Paris. 1923. Sept.-Oct.-Nov.-Dec. Vol. 23. No. 3. pp. 338–345.

The following scheme of treatment of amoebic dysentery is proposed:—

1. Daily injection of 0·08 gm. of emetine for 5 consecutive days

2. The first or second day following this course lavage with nitrate of silver as follows :—

Silver nitrate	25 centigrammes
Tinct. opii	20 drops
Distilled water	1,000 cc.

3. During the next 5 days this lavage should be continued, but the amount of silver nitrate should be doubled.

4. On the 16th or 17th day the silver nitrate should be increased to 75 cgm. and on the 27th or 28th day to 1 gm. The lavage should enter the intestine as rapidly as possible so as to distend the gut and to bring the folds of mucosa in contact with the solution. During the course of treatment the patient should continue to take 5 gms. of sodium sulphate daily.

P. H. M-B.

GOLDSMITH (A. A.) & GREENE (E. I.) [**Chaparro Amargosa in Amebic Dysentery.**]—*Illinois Med. Jl.* Oak Park. 1923. Dec. Vol. 44. p. 437. [Summarized in *Jl. Amer. Med. Assoc.* 1924. Jan. 26. Vol. 82. No. 4. p. 334.]

All parts of this plant from the root to the berry possess a characteristic bitter taste and are credited with medicinal properties. The authors think that there are certain rebellious cases of amoebic dysentery in which chaparro amargosa should be given a trial. Six to eight ounces of the infusion are given by the mouth daily, one half hour before each meal, and rectal enemata of 500 to 2,000 cc. of the infusion injected twice daily, the patient being instructed to retain the fluid as long as possible. It is advisable to continue treatment for a week or two after the subsidence of symptoms.

P. H. M-B.

i. NELIGAN (A. R.). **The Treatment of Liver Abscess by Aspiration.** —*Lancet.* 1923. Dec. 29. pp. 1398–1399. [2 refs.]

ii. EASMON (M. C. F.). **The Treatment of Liver Abscess by Aspiration.** [Correspondence.]—*Ibid.* Dec. 15. p. 1324.

i. Referring to the paper by MANSON-BAHR, LOW, PRATT and GREGG [see this *Bulletin,* Vol. 20, p. 705], Neligan is of the opinion that aspiration of liver abscess is preferable to open operation, from the point of view of both patient and surgeon. Opening a liver abscess is as much to be avoided as opening a tuberculous abscess. Puncture may be made with, or without, local anaesthesia, and may possibly have to be repeated on a subsequent occasion without serious detriment to the patient. Should, however, the abscess be situated in the epigastric or hypochondriac regions it is safer to incise the abdominal wall, pack off the peritoneal cavity and drain. Pitting of the skin on pressure, when present, is a most important and helpful sign. A puncture should always be made near the angle of the scapula should other attempts fail. The author rarely uses general anaesthesia. If a small incision or stab is made through the skin with a tenotome the introduction of the aspirator is rendered easy ; there is no pain once the body wall has been traversed. Quinine injected into the cavity of abscesses secondarily infected with streptococci may aid recovery. Effusion of serum into the abscess cavity subsequent to aspiration may be accompanied by pyrexia, suggesting reaccumulation of pus.

Lesions of the pleura at the right base or a chronic empyema may cause difficulty in diagnosis in countries when hepatic abscess is endemic. Tenderness on pressure between the ribs occurs in both conditions, and the appearance of the aspirated pus may not always help, for hepatic pus is not invariably of anchovy colour. Abscess of the upper posterior part of the right lobe of the liver may cause displacement of the heart. Lesions of the pleura may be associated with abscess of the liver.

It is necessary to distinguish between superficial intercostal tenderness and deep-seated pain due to inflammation of the liver ; both sides of the chest are compared using equal pressure.

Three cases are quoted in which the aspiration method was eminently successful. One had an abscess of the left lobe of the liver as well as of the spleen, requiring four aspirations. In none of the three was a leucocytosis present. In two cases serum was aspirated from the cavity on the second occasion and quinine (grs. 10) thereupon injected into the cavity.

ii. As showing the practicability of the aspiration method of liver abscess a case is quoted in which the operation was performed without any local anaesthetic in the out-patient department. The patient was a native of the West Coast of Africa, in whom a tumour about the size of a small football was present in the upper part of the abdomen, causing pressure oedema of both legs. The needle of an exploring syringe was passed into the tumour, and by means of a small piece of rubber tubing connected with a metal ear syringe of 1½ oz. capacity 35 oz. of liver pus were removed in about half an hour. The patient walked home after treatment and made an uneventful recovery, emetine being injected daily for 15 days.

P. H. M-B.

CARLES (Jacques). **Peut-on traiter médicalement une hépatite amibienne ?**—*Jl. de Méd. de Bordeaux.* 1922. Jan. 10. Vol. 94. No. 1. pp. 16–17. [11 refs.]

Amoebic hepatitis must be distinguished from abscess of the liver. Three cases are recorded which do not present any exceptional symptoms, but the author points out that in the early stages the toxaemia may be so great as to resemble that of typhoid. He considers that emetine injections are specific in this condition, and, just as in the case of intestinal amoebiasis, one should pursue the emetine treatment over a prolonged period.

P. H. M-B.

CIOTOLA (Alberto). **Della cura dell' ascesso epatico amebico.**—*Policlinico.* Sez. Prat. 1923. Dec. 17. Vol. 30. No. 51. pp. 1655–1657. [15 refs.]

Case of a man, aged 26 years, who developed an abscess of the liver 3–4 years after a diarrhoeic attack. The diagnosis was based mainly on clinical grounds, X-ray examination, a leucocytosis of 18,000 per cmm., and the presence of *E. histolytica* in the faeces. 12 cgm. of emetine hydrochloride was injected beneath the skin daily. The temperature began to fall within 24 hours and by the third day was normal. In a few days all pain had disappeared and the enlargement of the liver was reduced. Twelve months later, though the organ was larger than normal, there had been no recurrence, and the patient had gained 15 kilos in weight. The writer states that emetine in this condition is not, as a rule, given in sufficient doses, and he recommends 12 cgm. daily for 3–4 days. In such doses its action is so remarkable that "the diagnosis of amoebiasis may be definitely excluded in any case showing obscure symptoms which do not yield to emetine."

H. Harold Scott.

PERARD. **Trois cas d'abcès du foie.**—*Maroc-Médical.* 1923. July 15. No. 19. pp. 209–211.

A clinical account of three cases of liver abscess treated by operation. They presented a few novel points. In one case the differential diagnosis was between an abscess pointing on the lower surface of the liver, and duodenal or pyloric ulcer. The symptoms and the radiographic evidence were in favour of the latter diagnosis, but at operation the symptoms were found to be due to pressure of the abscess upon that portion of the intestinal tract.

P. H. M-B.

DELANOË (P.). **L'action du Stovarsol ou "composé 190" dans la dysenterie amibienne.**—*Maroc-Médical.* 1923. May 15. No. 17. p. 150. [1 ref.]

Stimulated by the work of MARCHOUX upon stovarsol in dysentery [see this *Bulletin*, Vol. 20, p. 712] the author tried the treatment upon a dysenteric case of 4 years' duration, treated with emetine and emetine bismuth iodide, and later with Ravaut's paste and novarsenobenzol in cachets (Narsenol). Although greatly benefited, he was not completely cured, but under stovarsol he lost his diarrhoea and gained weight rapidly. The course lasts 10 days, each dose consists of ·25 gram in cachet, and two are given daily.

P. H. M-B.

KESSEL (John F.). **Experimental Infection of Culture Rats and Mice with the Common Intestinal Amebae of Man.**—*Proc. Soc. Experim. Biol. & Med.* 1923. Nov. Vol. 21. No. 2. pp. 110–111.

The investigation was undertaken as a control to previous investigations on infection of rats and mice with *Endameba dysenteriae.* Five species of human intestinal amoebae, *Endameba dysenteriae, E. coli, Councilmania lafleuri, Endolimax nana,* and *Iodameba buetschlii* have been experimentally transferred to rats by feeding them on human faeces containing cysts of these amoebae, while infections of *E. dysenteriae, E. coli* and *C. lafleuri* have been transferred from one rat to another. The data suggest the possibility of rodents acting as carriers of amoebiasis.

P. H. M-B.

FRANCHINI (Filippo). **Amebiasi nella provincia di Bologna. II.—Amebiasi spontanea nel gatto concomitante ad una epidemia di dissenteria amebica nell' uomo.** [Amoebiasis of the Cat concomitant with an Epidemic of Amoebic Dysentery in Man.]—*Ann. di Med. Nav. e Colon.* 1923. Jan.–Feb. Year 29. Vol. 1. No. 1–2. pp. 1–52. With 5 plates. [Numerous refs. in foot notes.]

The writer discusses very fully the question of dysentery in cats, the characters of the amoebae present and the pathological lesions produced by them. Five plates with a large number of photographs and drawings illustrate the paper. Instances are given of spontaneous outbreaks of dysentery in cats preceding and accompanying human outbreaks, of which the following may be quoted as an example:—In 1919 there was an extensive epidemic of amoebic dysentery among the cats of Selva, Alberino and Marmorta. There was no human case at Selva, 12 at Alberino, and some at Marmorta. In 1920 the epizootic abated at Selva and Marmorta and diminished at Alberino while the number of human cases increased. In the following year, without any further outbreak among cats, cases continued to occur in man. Of the twelve at Alberino in 1919 all but one had lived in houses where cats were ill or had died. In ten out of fifteen habitations where human cases occurred, cats had also suffered. The author argues from these facts that the cat epidemic determined and controlled that in man. [Throughout this long paper, however, no mention seems to be made relative to the passage of cysts by cats, so the causal connexion between the epidemic among them and that in man is still hypothetical.]

H. Harold Scott.

FRANCHINI (Filippo). **Esiste in Italia la dissenteria amebica?**—*Policlinico.* Sez. Prat. 1923. Nov. 26. Vol. 30. No. 48. pp. 1556–1561. [3 refs.]

This contribution is of a polemical nature called forth by a statement of Professor CASAGRANDI that true amoebic dysentery did not exist in Italy. The author has not carried out animal experiments, but states that amoebae morphologically identical with *E. histolytica* have been seen by him in the stools of several "dysentery" cases, that the general condition cleared up on treatment with emetine, that the amoebae disappeared, and that his colleagues as well as himself have seen enlargements of the liver resolve with emetine treatment and, in one case which was submitted to operation, amoebae were found in the evacuated pus.

H. Harold Scott.

i. PANAYOTATOU (Angélique). **Quelques mots sur l'histoire de "l'Amibiase bronchique en Egypte."**—*Grèce Méd.* 1923. Oct.-Nov. Vol. 25. No. 10–11. pp. 53-55 & *Rev. Prat. Malad. des Pays Chauds.* 1924. Jan. Year 2. Vol. 3. No. 5. pp. 361-367.

—— **Sur "l'amibiase bronchique." L'amibiase primitive des bronches chez les enfants en Egypte.**—*Rev. Méd. et Hyg. Trop.* 1924. Feb. Vol. 16. No. 2. pp. 33-50.

ii. MOULINIER (René). **Médiastinite chronique, séquelle d'hepatite dysenterique. Nouveau cas.**—*Gaz. hebd. des Sciences Méd. de Bordeaux.* 1923. Nov. 18. Vol. 44. No. 46. pp. 583–584. With 1 fig. [1 ref.]

iii. LEONARD (T. M. R.). **A case of Acute Hepatic Abscess—Amoebic: cured by Emetine without Operative Aid.**—*Nigeria Ann. Med & San. Rep. for the Year 1922.* pp. 27–28.

iv. PICCOLI (Giovanni). **Contributo allo studio dell' ascesso dissenterico del fegato.** [Amoebic Abscess of the Liver.]—*Giorn. de Med. Milit.* 1923. Dec. 1. Vol. 71. No. 12. pp. 621–630. [22 refs.]

v. THURSTON (E. Owen). **Treatment of Liver Abscess by Aspiration**—[Correspondence.]—*Lancet.* 1924. Mar. 1. p. 465.

i. Contributions on amoebic bronchitis as seen in Egypt; no new information.

ii. The clinical record of a case of mediastinitis thought to be secondary to amoebic hepatitis. No amoebae were found.

iii. A simple case of acute amoebic hepatitis which rapidly yielded to the administration of emetine, a total of 28 grs. The patient had malaria also.

iv. A general account of this condition with brief notes of four cases, all of which were treated surgically. The paper contains nothing new.

v. Thurston believes that the results of aspiration combined with emetine therapy are immeasurably superior to the old open operation and proposes to publish a further series of 63 cases.

P. H. M-B.

BACILLARY DYSENTERY.

BAMFORTH (J.) **A Small Outbreak of Dysentery associated with an Unusual Bacillus.**—*Proc. Roy. Soc. Med.* (Sect. Trop. Dis. & Parasit.). 1924. Feb. Vol. 17. No. 4. pp. 25–29. [5 refs.] and *Jl. of Hyg.* 1924. Mar. Vol. 22. No. 3. pp. 343–347. [5 refs.]

A record of six cases of dysentery occurring in an institution in England in January 1923. The symptoms were clinically those of bacillary dysentery. The specimens of faeces collected from four cases yielded an almost pure culture of an organism which was definitely and specifically agglutinated by the blood serum of the cases. In its reactions the organism appears to conform with the paradysentery bacillus described by MITA. (See this *Bulletin*, Vol. 19, p. 335.)

It closely resembles also the organism described by SONNE, considered to be the most frequent cause of dysentery in Scandinavia. The author thinks that a further investigation of cases of diarrhoea and dysentery occurring in this country will yield strains of this organism.

P. H. M-B.

LAURINSICH (A.) **Sulle siero-agglutinazioni nelle sindromi dissenteriformi della prima infanzia.** [Agglutination in the " Dysenteries " of Early Infancy.]—*Pediatria.* 1924. Mar. 15. Vol. 32. No. 6. pp. 331–345. [49 refs.]

With a view to shedding light on the actual causes of summer diarrhoea and dysenteric symptoms in infants the author tested the agglutinating power of the serum of patients on organisms isolated from the faeces. Seeing that over a hundred sera were tested, each on ten or more organisms, the amount of work must have been enormous, and it is greatly to be regretted that the results obtained are so incommensurate with the time and trouble spent. It is difficult in some instances to reconcile the statements in the tables with the explanations in the letterpress. Thus, in Table I the bacteriological diagnosis is stated to be "Shiga-Kruse infection," but one serum agglutinated Flexner's bacillus in a dilution of 1 : 100 and was negative to Shiga. Again, in Table V the diagnosis is "Gaertner's bacillus," but only one out of four sera agglutinated that organism, with a serum in dilution 1 : 100, and that same serum agglutinated Hiss's bacillus in 1 : 400. This anomaly is explained by saying that the group agglutinins exceeded the specific, but in three of the four in this table there appear to have been no specific agglutinins for Gaertner's bacillus and in one of them no agglutination at all of any of the 11 organisms experimented upon. In a great majority of cases the serum agglutinated more than one; this is ascribed as possibly due to some previous infection. The author concludes that at present it is not certain that dysenteric organisms always provoke the formation of specific agglutinins, at all events in sufficient strength to warrant a diagnosis on these grounds.

H. Harold Scott.

LAURINSICH (A.) **Richerche sull' etiologia delle sindromi dissenteriformi nel lattante.** [The Etiology of " Dysentery " in Sucklings.] —*Pediatria.* 1924. Jan. 1. Vol. 32. No. 1. pp. 34–43. [34 refs.]

There has for a long time been a tendency to ascribe all abnormal conditions of the alimentary tract in young children to errors of nutrition, but cases undoubtedly occur of infants at the breast suffering from symptoms of a dysenteric character, though usually more benign and of shorter course than dysentery in older children.

The author has studied bacteriologically the faeces of 52 infants suffering from dysenteric symptoms—loose stools with mucus and blood. Specimens were examined as soon as possible after they were passed. Thirty-two of the patients were on a mixed breast and artificial feeding, 20 on the latter only. Strange to say, more cases occurred amongst the former. From 17 no special organism was isolated, merely staphylococci, streptococci, or some form of *B. proteus* ; from 3 *B. paratyphosus* B ; 3 cases were ascribed to *B. coli*, in two of which the organism was haemolytic. In 35 instances one or other of the dysenteric group of organisms was isolated, namely Hiss-Russell (Y) in 16, Flexner in 8, Strong in 7, Shiga-Kruse in 3, Gaertner in 1. It is worthy of special note that the variety of the bacillus isolated appeared to bear no regular relation to the severity of the clinical condition ; for example, a patient might be seriously ill although the organism obtained was one generally regarded as non-toxic.

H. Harold Scott.

PONS (R.). **Note sur un coccobacille constituant la flore dominante de diarrhées infantiles considérées comme dysentériques.**—*Bull. Soc. Path. Exot.* 1923. Dec. 12. Vol. 16. No. 10. pp. 708–710.

The close of the rainy season in Saigon is marked by a recrudescence of intestinal diseases, in particular bacillary dysentery. The majority of cases did not exhibit toxic symptoms and rapidly recovered, but others soon developed a typhoidal aspect and succumbed. In most cases in infants dysentery bacilli of recognised types were isolated, but in certain instances a Gram-negative organism was detected, a short non-motile cocco-bacillus generally occurring in characteristic clumps in the faeces, but forming chains on culture. On solid media it behaves as a facultative anaerobe and on gelatin it forms circular smooth colonies. Inert on solutions of the majority of sugars it ferments glucose with great difficulty. It is extremely pathogenic to guineapigs ; 1 cc. of a culture emulsion kills them in 24 hours, while rabbits, rats and mice are likewise susceptible. In many of its characteristics it resembles organisms of the Pasteurella group.

P. H. M-B.

SEKI (Tadahide). **Ueber einen eigenartigen Ruhrerreger.** [A Peculiar Dysenteric Organism.]—*Cent. f. Bakt.* 1. Abt. Orig. 1923. Oct. 31. Vol. 91. No. 2. pp. 101–102.

This paper is founded upon a study, undertaken in 1913, of 12 cases of dysentery, three of which were fatal. An organism was obtained from the stools of all, and agglutinated by their serum in a dilution of 1 in 60. It was actively motile and in its cultural reactions resembled paratyphoid B. Indol was produced. The strain was highly pathogenic to guineapigs, rabbits and mice, and produced in them dysenteric symptoms.

P. H. M-B.

HARJAS RAI. **Dysentery Carriers among the Hill Villages in the Neighbourhood of Kasauli (N.W. Himalayas).**—*Indian Jl. Med. Res.* 1924. Jan. Vol. 11. No. 3. pp. 943–945.

Using the technique advocated by F. P. MACKIE, the author isolated dysentery bacilli in 5·4 per cent. of 201 specimens of faeces from different villages, the majority being Flexner-Y strains.

P. H. M-B.

KNORR (Max.). **Die Katalasereaktion zur sofortigen Unterscheidung von echter und Pseudoruhr.** [Use of the Catalase Reaction for the Prompt Differentiation of True and Pseudo Dysentery.]—*Muench. Med. Woch.* 1923. Nov. 16. Vol. 70. No. 46. pp. 1381–1382.

This paper describes a new method of differentiating the true Shiga dysentery bacilli from the pseudo-dysentery organisms. It is known as the Catalase reaction, and is due to the formation of hydrogen peroxide by the oxygen given off by the ferments during their formation on culture; for instance, living cultures when placed in 2–3 per cent. solution of hydrogen peroxide cause great frothiness of the solution. The technique consists of half filling two capillary test tubes, 4 cm. long by 2 mm. broad, with 2 per cent. hydrogen peroxide. A small amount of the dysentery culture is removed on a platinum rod and placed in the solution. The second tube is inoculated with a culture which is known to give a definite Catalase reaction, as for instance *B. pyocyaneus.* The pseudo-dysentery cultures invariably produce a marked frothiness of the medium, which the Shiga-Kruse bacillus does not do. The author has compared 7 true dysentery strains with 19 pseudo-dysentery strains, and gives the result in a table. This reaction is more certain than the fermentation of mannite, a substance which the Shiga-Kruse never ferments, but which most of the pseudo-dysentery bacilli do.

P. H. M-B.

KECK (Albert). **Die Katalasereaktion bei Ruhrbazillen**—*Muench. Med. Woch.* 1924. Feb. 29. Vol. 71. No. 9. pp. 272–273.

KNORR having stated that the catalase reaction is given by pseudo-dysentery organisms, but not by well-established typical strains, the author repeated his experiments, but did not succeed entirely in confirming his results.

P. H. M-B.

KUNDRATITZ (Nelly). **Ueber Stomatitis ulcerosa cachectica als Komplikation bei bazillärer Ruhr.** [Ulcerative Stomatitis complicating Bacillary Dysentery.]—*Monatsschr. f. Kinderheilk.* 1921. Vol. 21. pp. 366–373. [14 refs.]

In this Viennese Hospital 77 children were treated for bacillary dysentery in 1919, and 53 in 1920. The case mortality in the former year was 9 per cent. and in the latter 10. Serum treatment was the rule. The febrile period in the severe cases lasted as long as three weeks. Convalescence was marked by alternate constipation and diarrhoea. Relapses were rarely observed. Attention is drawn to an hitherto undescribed complication of bacillary dysentery, *i.e.*, severe ulcerative stomatitis with accompanying necrosis of the alveolus. It was thought at first to be identical with noma. Two such cases are described, one of which died. The condition was treated by painting with methylene blue and by mouth washes. Bacteriological examination showed no distinctive organisms in the necrotic tissue.

P. H. M-B.

WALKO (Karl). **Ueber die Spätfolgen der Ruhr.** [The Sequelae of Dysentery.]—*Med. Klin.* 1923. Oct. 7. Vol. 19. No. 40. pp. 1319–1323. [45 refs.]

As a result of the number of carriers of dysentery bacilli who returned home at the end of the war small epidemics of dysentery have arisen all over the country; for instance, in one small town in Bohemia there were 240 patients, with a death-rate of 26 per cent., for the most part children. The author does not believe in healthy carriers of dysentery; those he has seen on more minute examination exhibit symptoms of intestinal disturbance with occasional diarrhoea. The gastric analyses of 27 such cases showed that 15 were suffering from disordered secretion of hydrochloric acid; hyperacidity is quite common. Sigmoidoscopic examination of 167 cases with a history of dysentery showed that after one year 19 per cent., after 2 years 12 per cent., after 3 years 8 per cent., and thereafter 4–7 per cent. had unhealed lesions. One of the most marked sequelae is an abnormal susceptibility of the intestinal canal to disturbances of all kinds. Affections of the large gut were noted, such as chronic colitis, and even the form known as colitis haemorrhagica. The author thinks that gastric and duodenal ulcers may also result, and he has found them 11 times in 120 cases investigated.

P. H. M-B.

BORNHAGEN (Hanna). **Ruhrbehandlung mit Karenz und parenteralen Infusionen von physiologischer Kochsalzlösung und Normosal.** [Treatment of Dysentery by Starvation and Parenteral Infusions of Physiological Serum.]—*Med. Klin.* 1923. Oct. 21. Vol. 19. No. 42. pp. 1395–1398. [3 refs.]

Twenty patients with bacillary dysentery were treated with parenteral injections, a litre or less, of "normosal," a mixture of inorganic salts which as far as possible represents human serum. Fifteen recovered, including all who were treated in the first week of the infection. Many of the cases were severe.

P. H. M-B.

SCHÖNFELDER (Trygve). **Sérum antidysentérique coagulé, résiduel et purifié.**—*Ann. Inst. Pasteur.* 1923. Nov. Vol. 37. No. 11. pp. 941–942.

Antidysenteric serum prepared with cultures of Shiga's bacillus can be titrated with great precision, and for this purpose rabbits and mice serve excellently. The author has worked almost entirely with white mice, injecting them subcutaneously with serum and on the following day inoculating them intraperitoneally with the virus. This is made from twenty-four hour old cultures emulsified in physiological saline. In one series of experiments the mice were given a lethal dose of virus, representing 0·3 cc. of a culture-emulsion diluted ten times. In another series the virus was five times stronger or 1·5 cc. of the same emulsion. The quantity of serum varied from 0·0002 to 0·5 cc. and in order to establish a standard for comparison an endeavour has been made to ascertain the minimal quantity necessary to protect the animal against one or five lethal doses of living organisms.

The antidysenteric serum employed has been of five kinds, the ordinary commercial serum, desiccated commercial serum diluted ten times, a serum coagulated at 58° C. diluted ten times, purified serum, and "residual" serum washed in physiological serum and diluted to the same degree.

In the first series the inoculated virus represented a single lethal dose, and the amount of serum necessary is given as follows :—

(*a*) Liquid serum	0·005 cc.
(*b*) Desiccated serum	0·005 cc.
(*c*) Coagulated serum ..	0·005 cc.
(*d*) Purified serum	0·01 cc.
(*e*) Residual serum	0·05 cc.

In the second series the inoculated virus represented five lethal doses, and the following doses of serum were necessary :—

(*a*) Liquid serum	0·00625 cc.
(*b*) Desiccated serum	0·00625 cc.
(*c*) Coagulated serum ..	0·025 cc.
(*d*) Purified serum	0·012 cc.
(*e*) Residual serum	0·4 did not prevent death.

The conclusion is that antidysenteric serum coagulated at 58° C. is almost as effective in its prophylactic properties as it is in the liquid form.

P. H. M-B.

LUCCHINI (Carlo). [**Exotoxine et endotoxine dysentérique (Études sur l'intestin isolé).**]—*L'Igiene Moderna.* 1923. June. Vol. 16. No. 6. p. 301. [Summarized in *Bull. Office Internat. d'Hyg. Publique.* 1923. Oct. Vol. 15. No. 10. p. 1359.]

The exotoxin of the Shiga-Kruse bacillus possesses not only a generalized, but also a specific toxic action, upon the isolated loop of rabbit's intestine. Even in great dilution it causes an augmentation in the tone and the rhythmic movements ; whereas in stronger doses it causes a total arrest of all contractions. The most interesting of all the observations is the production of anti-peristaltic movements, produced even with a toxin which has been heated to 75° C. for an hour. On the other hand, the dysenteric endotoxin has no action whatever upon the isolated intestine.

P. H. M-B.

SAKAUCHI (Enji). [**On the Specificity of Decomposition of Sugar by Bacillus Dysenteriae : Biological Study of Bacillus Dysenteriae. I. Part.**]—*Keio Igaku (Kei-O Med. Jl.).* 1923. Mar. Vol. 3. No. 3. [Summarized in *Japan Med. World.* Tokyo. 1923. Nov. 15. Vol. 3. No. 11. pp. 249–250.]

The author endeavoured to mutate the fermentation process of various strains of *B. dysenteriae.* He obtained a "saccharolytic" strain from a "Y" culture by cultivation for 40 days in a medium containing 1·5 per cent. saccharose. It acquired in addition the power of decomposing maltose and dextrin. The strains retained their immunological properties.

P. H. M-B.

WOLLMAN (E.) **Recherches sur le phénomène de d'Herelle. Action de la trypsine sur le bactériophage du bacille de Shiga.**—*C. R. Soc. Biol.* 1924. Jan. 25. Vol. 90. No. 2. pp. 59-60.

The studies so far undertaken on d'Herelle's phenomenon have omitted to take into due consideration the nature of the medium in which the test has been applied, for instance the albuminous content of the fluid. For this reason the action of proteolytic ferments upon the lytic substance was studied. The action of trypsin was first considered, and it was found that the organism, notably Shiga's bacillus, flourished luxuriantly in this ferment, in a dilution of 1 : 200. The technique is described of experiments which lead to the conclusion that the lytic substance is entirely destroyed by the action of trypsin. Pepsin and papaïne proved, however, to be quite inactive in this respect. The conclusion is that the transmission of the lysogenic function is bound up with the existence of an albuminoid substance (possibly in the form of corpuscules) and disappears when this substance has undergone tryptic digestion.

P. H. M-B.

BROKMAN (H.). **Recherches sur la sensibilité individuelle de l'homme à la toxine dysentérique.** –*C.R. Soc. Biol.* 1923. Dec. 22. Vol. 89. No. 37. pp. 1355-1356.

During recent years it has been shown that considerable discrepancy exists in the individual susceptibility to diphtheritic toxin injected subcutaneously. The present paper deals with the sensibility of certain individuals to the Shiga-Kruse toxin. The standard employed was the toxin prepared in the State laboratory which was lethal to a rabbit in the dose of 0·1 gm. per kilogramme of body-weight; 0·1 cc. of a 3 per cent. solution in normal saline was injected subcutaneously. Several hours after the injection an inflammatory area was noted, and at the end of twenty-four hours an oedematous zone which finally assumed a bluish tint. In the most marked reactions a haemorrhagic zone appeared after 48 hours. Insusceptible individuals showed only a fugitive erythema. In 20 per cent. of individuals a negative reaction was observed. The author attempted to prove that the reaction depended upon the toxic properties of the inoculation; two controls were instituted, one with dysenteric toxin boiled for 10 minutes in order to destroy the toxic element, the other neutralized with antidysenteric serum. No reaction resulted from either. Eventually he was led to believe that differences in individual reactions were best explained by the presence of antitoxin in the blood of insusceptible individuals. He therefore mixed the serum of such an individual diluted 1 : 50 with an equal amount of toxin and incubated the mixture for 50 minutes. No reaction occurred after injection into susceptible individuals.

P. H. M-B.

POZERSKI (E.). **Sur l'excrétion de produits phosphorés par le Bacille de Shiga amené à la limite de sa végétabilité, soit par le chauffage, soit par l'addition de formol.**—*C.R. Soc. Biol.* 1923. Dec. 1. Vol. 89. No. 34. pp. 1094–1095. [3 refs.]

In a former communication the author noted that the addition of formol in a strength of 1 : 400 to a culture of Shiga's bacillus, not only prevented further growth of the organism, but also hindered the excretion of phosphorus products. But if formol is added in a strength of 1 : 4,000 growth is retarded after three hours' contact while the excretion of phosphorus compounds is maintained for another four days. Warming an emulsion to 60° C. for half an hour greatly attenuates the growth, and at 65° reproduction ceases. At the former temperature only minute traces of phosphorus are excreted.

P. H. M-B.

KOSTRZEWSKI (J.). **Krew chorych na czerwonke pod wzgledem bakterjologicznym i serologicznym. (Doniesienie III.) Bakteriologische und serologische Blutuntersuchungen bei Dysenteriekranken (III. Mitteilung).**—*Medycyna Doświadczalna i Społczna.* Warsaw. 1923. Vol. 1. No. 5–6–7. pp. 345–352. German Summary p. 351. [2 refs.]

This paper describes the successful isolation of Shiga's bacillus from the blood in 8·14 per cent. of cases studied in 1921. The mortality rate of this series was considerably smaller than those investigated in 1919. (See this *Bulletin*, Vol. 19, p. 37.) Positive agglutination results were obtained in 26·8 per cent. of cases.

P. H. M-B.

FEJGIN (Bronislawa). **Contribution à l'étude des races resistantes du bacille de Shiga-Kruse.**—*C.R. Soc. Biol.* 1923. Dec. 22. Vol. 89. No. 37. pp. 1381–1383.

The author studied a race of Shiga-Kruse bacilli which, on subculture, developed colonies resistant to the anti-Shiga bacteriophage. The individual organisms resembled *Bacillus coli* in form and the growth they produced on agar was denser than that of the Shiga bacillus. One of the subcultures provoked typical reactions with solutions of the sugars, another fermented glucose, maltose, laevulose and mannite; while the third produced acid and gas in lactose, glucose, arabinose, laevulose, mannite and dulcite and, in addition, reduced neutral red. Their agglutination reactions with polyvalent antidysenteric serum also varied considerably, while the organisms did not absorb agglutinins from this serum. Three rabbits were immunized, one with each of the strains, with the result that agglutinins to B. Shiga were produced and an antilytic substance. The toxicity of these resistant organisms was greatly reduced. The conclusion is reached that under the influence of the lytic substance is produced a new race differing in serological and biochemical properties from the original strain of B. Shiga.

P. H. M-B.

DOORENBOS (W.) & MULDERS (J.) **Melkpasteurisatie in verband met dysenteriebacteriën.** [Pasteurization of Milk infected with Dysentery Bacilli.]—*Tijdschr. v. Vergelijkende Geneesk. enz.* Leyden. 1924. Jan. 17. Vol. 10. No. 1. pp. 51–69. With 1 plate. [29 refs.] [English summary p. 66.]

Dysentery bacilli are easily killed at a temperature ranging from 50–60° C., less easily when suspended in milk than in water. Salts, peptone, sugars and broth seem to exert a protective action. Shiga's bacillus is killed in water in one, in milk in six minutes. The Leyden type of dysentery bacillus is more resistant than are the others to high temperatures. When a suspension of dysentery bacilli in milk is heated to 60° C. in bottles all the different types are completely destroyed in one hour, but the milk itself takes half an hour to reach this temperature.

P. H. M-B.

GAUTHIER (Aimé). **Essais de vaccinations et de vaccinothérapie par la voie buccale contre la dysenterie bacillaire.**—*Bull. Acad. Méd.* 1924. Jan. 15. Year 88. Vol. 91. 3rd Ser. No. 3. pp. 72–82.

The author of this paper was deputed by the League of Nations to inoculate the numerous refugees from Asia Minor and Eastern Thrace who poured into Greece after the disaster to the Greek Army in August 1923. His duties were to protect these unfortunate people against typhoid, cholera, smallpox, plague and dysentery. The total work performed may be judged by the following table.

Vaccination against smallpox	1,262,889
Tetra inoculation (T.A.B. & cholera) ...	651,680
Antiplague inoculations	93,243
Vaccination against dysentery (buccal route)	29,880
Typhoid vaccination (buccal route) ...	3,900

It is especially with the dysentery aspect of the subject that the author deals. At first he attempted inoculation by the hypodermic method, with a polyvalent vaccine of Shiga, Flexner and Hiss organisms. The reactions were very severe and abscesses sometimes resulted. By the buccal route two strains of vaccine were used; each contained 3,000,000,000 dead organisms to the cc., one composed of Shiga and Flexner, and the other with the addition of Strong's bacillus and Y.

The latter vaccine was rendered sterile by the addition of weak carbolic acid. Both seemed to exert the same protective action, but for massive work the carbolized preparation proved the more convenient. The dose was 1 cc. for an adult, half for from 2 to 6 years of age and a quarter for an infant under two, repeated for three days in succession. No reaction followed the administration. The serum reactions showed more positive agglutination after vaccination than was observed in cases suffering from bacillary dysentery. The titre of serum usually reached 1 : 250 for Flexner and Shiga on the third day. This method appeared to be most effective.

An epidemic of bacillary dysentery in the island of Hydra ceased immediately buccal vaccination was commenced. Six other local epidemics are recorded in which the result was equally striking. The vaccine also has therapeutic qualities; it is best given in mild cases for 3 or 4 days, in severe cases for 7 or 8 days, in daily doses not exceeding 2 cc. subdivided in three portions; in chronic cases this treatment is to be repeated at four-day intervals until all symptoms disappear. In cases of mild dysentery or simple diarrhoea an effect is seen within 24–48 hours. In acute dysentery treatment should be continued in this manner for 6 days after cessation of symptoms.

P. H. M-B.

ANGLADE. **Note concernant un essai de vaccination locale de l'intestin contre la dysenterie, d'après le procédé de Besredka.**—*C.R. Soc. Biol.* 1924. Feb. 22. Vol. 90. No. 6. pp. 395–396.

A severe epidemic of bacillary dysentery having broken out in the Versailles garrison, immunization *per os* on the lines described by BESREDKA was instituted. No more deaths took place, and subsequently amongst the uninoculated 40 per cent. contracted the infection as contrasted with 7·6 per cent. of the inoculated. These figures, obtained from a total of 1616 men, are much in favour of this method of protection, and the author considers thev would have been better had it been possible to ascertain by individual supervision that the pastilles were actually swallowed in every case.

P. H. M-B.

ANTONOVSKY (A.) **Essai de vaccination antidysentérique** *per os*, **d'après le procédé de Besredka.**—*C.R. Soc. Biol.* 1924. Mar. 7. Vol. 90. No. 8. p. 564.

There was an extensive epidemic of bacillary dysentery in Petrograd in 1923, so that vaccination *per os*, according to BESREDKA's method, was put to the test. The first case was noted on July 13, vaccination lasted three days, and when completed on July 31 some 85 cases of dysentery had occurred. 1,000 out of a total of 2,768 persons in one asylum were thus treated, while 1,768 were not vaccinated. Up to the end of the epidemic on September 15 there were recorded 56 cases of dysentery among the non-vaccinated and 12 amongst the vaccinated, of which 9 occurred within 10 days of vaccination.

The mortality rate was 3·1 per cent. in the non-vaccinated and 0·3 per cent. in the vaccinated. In the Botkine hospital, where all the dysenteric patients were collected, the personnel was for the greater part vaccinated *per os*. Amongst 257 persons thus treated only 1 contracted dysentery, amongst 105 non-vaccinated there were 4 cases.

P. H. M-B.

i. AIYA (Tomogoro). [**On the Relation between the Contraction of the Scrotum and the Prognosis of a Disease, especially of Ekiri and Infantile Dysentery.**]—*Tokyo Iji-Shinshi* (*Tokyo Med. News*). 1923. Feb. No. 2315. [Summarized in *Japan Med. World.* Tokyo. 1923. Oct. 15. Vol. 3. Nos. 9 & 10. p. 224.]

ii. TANAKA (Toshiwo). [**On the Cerebral Symptoms and the Genesis of the Syndrome in Severe Infantile Dysentery and Ekiri.**]—*Iji Shimbun* (*Med. News*). 1923. Mar. No. 1114. [Summarized in *Japan Med. World.* Tokyo. 1923. Oct. 15. Vol. 3. Nos. 9 & 10. p. 224.]

iii. TANAKA (Asazo). [**On a Variety of Non-Acid Dysentery Bacillus.**]—*Kaigun Gun-I-Kwai Kwaiho* (*Proc. of the Nav. Med. Corps*). 1923. May. No. 40. [Summarized in *Japan Med. World.* Tokyo. 1923. Dec. 15. Vol. 3. No. 12. p. 280.]

iv. YAMADA (Tsunetomi), INOUYE (Zenjuro) & KAKINUMA (Ryoji). **Expedition for Prevention of Dysentery prevailed in a Small Island: Toshima.**—*Scientific Reports from Govt. Inst. for Infect. Dis.* Tokyo. 1922. Vol. 1. p. 73.

v. LIPINSKI (Witold). **Wplyw podlozy cukrowych na zdolność zlepna pratków czerwonkowych. Influence des milieux sucrés sur l'agglutination des bacilles dysentériques.**—*Medycyna Doswiadczalna i Spoleczna.* Warsaw. 1923. Vol. 1. No. 5–6–7. pp. 305–316. French summary p. 315. [14 refs.]

i. The contraction of the scrotum in ekiri forebodes a bad prognosis and coincides with cerebral symptoms, cyanosis, weakened cardiac function, etc.

ii. The author ascribes the cerebral symptoms of ekiri to secondary encephalitis due to the absorption of dysenteric toxins.

iii. In every case of diarrhoea and dysentery that occurred in the Sosebo Naval Station a variety of non-acid dysentery bacillus could be isolated, and appeared to be identical with Schmitz's bacillus. It is agglutinated strongly by the patient's serum, but not at all by Shiga serum.

iv. Briefly describes a small epidemic of dysentery caused by Shiga's bacillus. There were 36 cases and 2 deaths.

v. When grown on sugar media some strains of Shiga's bacillus, which formerly clumped with difficulty, did so with ease even with greatly diluted serum.

P. H. M-B.

MIXED AND UNCLASSED DYSENTERY.

BASSETT-SMITH (Percy). **Naval Medical History of the War. Section of Tropical and Sub-Tropical Medicine. Part III.—(i) Dysentery; (ii) Liver Abscess; (iii) Sprue; and (iv) Epidemic Diarrhoea.** [By DUDLEY (S. F.).]—*Jl. Roy. Nav. Med. Serv.* 1923. July & Oct. Vol. 9. Nos. 3 & 4. pp. 203–211; 270–277. With 1 chart.

(i) "Torrified Meal," a substance supplied to the British Admiralty during the War, was investigated in order to test the claims that had been made for it. The belief was that its action was antiseptic and prevented excessive fermentation in the bowel, and that by the conversion of gluten into peptones and starch into dextrin intestinal assimilation was facilitated. The meal was prepared from wheaten flour, bean, barley and rice flour, and of these the first only was thoroughly investigated.

Bacteriological tests showed that it exerted no inhibitory effect upon cultures of pathogenic intestinal organisms *in vitro.* From feeding experiments on guineapigs it became evident that it was insufficient to nourish the young animals or to prevent the onset of scurvy. The results of clinical treatment on 5 chronic bacillary and amoebic dysentery cases was favourable, but antiscorbutic substances must be given and the patient should be kept in bed.

(ii) Considering the number of cases of amoebic dysentery the records of liver abscess in the Navy during the War are very few. There were 3 cases in 1915 and one each in 1917 and 1918.

(iii) During the War there was a very considerable number of post-dysentery sprue cases. A clinical record with autopsy findings in an advanced case with tetany is given.

(iv) An account of a serious epidemic of diarrhoea at the Aircraft Depot, Dunkirk, in July and August 1917 associated with large numbers of houseflies. Out of a complement of 1,500 344 cases were admitted to the sick list, while an equal number remained at work. Some cases were dysenteric and passed blood and mucus, although no pathogenic organisms, with the exception of B. Morgan No. 1, were isolated. Everything possible was done to protect the food from flies, but these efforts were nugatory on account of the insanitary state of a neighbouring camp.

P. H. M-B.

DESCHIENS (R.). **Le rôle pathogène de "Giardia (Lamblia) Intestinalis."**—*Arch. des Malad. de l'Appareil Digestif et de la Nutrition.* [? 1923.] Vol. 13. pp. 136–148. With 1 plate & 1 text fig. [3 refs.]

This is an argument upholding the proposition that *Giardia intestinalis* is pathogenetic. After a brief historical retrospect the author records in detail a considerable series of varied experiments that confirm the experimental evidence published in 1916 by FANTHAM and PORTER in support of that proposition. (See this *Bulletin,* Vol. 8, p. 454.) Using all laboratory formalities of execution and control, he brought about enteric disturbance and true dysenteriform outbursts in 96 per cent. of clean young cats (*a*) fed on cysts of *Giardia muris* and *intestinalis,* and (*b*) inoculated per rectum with active forms of the latter; in a large proportion of cases the attacks were rather rapidly mortal, and at the autopsies inflammatory and necrotic lesions were found in the intestine, along with active forms of the parasite throughout the intestinal tract, but particularly in the small intestine where the follicles of Lieberkuhn and the spaces between the villi were stuffed with them. He also produced diarrhoea—in 60 and 66 per cent. of cases fatal—in clean mice fed (*a*) on cysts of *G. intestinalis* and (*b*) on cysts of a strain of *G. muris* that had caused fatal enteritis in the cat, and a non-fatal diarrhoea in 60 per cent. of clean mice fed on cysts of ordinary *G. muris*; but he could not injure mice already infected with *G. muris* in attempts to super-infect them with *G. intestinalis.* The author, furthermore, marshals the recorded anatomical, clinical, and statistical evidence supporting the pathological interpretation of *Giardia,* but he adds nothing more from his personal experience except the statement that in the stools of 300 healthy subjects examined by him in recent years Giardia cysts were discovered in only 1·7 per cent. against 5 per cent. in stools from 300 dysenteric and enteritic subjects.

A. Alcock.

DESCHIENS (R.). **Sur l'habitat et la répartition des Giardies chez les "Porteurs sains" et les "Porteurs malades."**—*Bull. Soc. Path. Exot.* 1923. Dec. 12. Vol. 16. No. 10. pp. 735–737. [7 refs.]

The object of this paper is to emphasize the fact that Giardia is not, even in healthy hosts, limited to the duodenum and its immediate vicinity, but that its distribution is influenced by varying conditions of the intestine, even by phases of digestion.

A. A.

LE NOIR & DESCHIENS (R.). **Action antiparasitaire du carbonate de bismuth à doses massives dans certaines infestations vermineuses ou à protozoaires du tube digestif.**—*Arch. des Malad. de l'Appareil Digestif et de la Nutrition.* 1923. Nov. Vol. 13. No. 9. 7 pp.

In this section only pp. 5–6, dealing with *Giardia intestinalis,* are considered. Results are given of 9 cases of infection with this parasite treated with *pure* carbonate of bismuth according to the following formula :— A course of 30 gm. daily given in the morning, on an empty stomach, for 8 days, the course to be reiterated at two-day intervals for 42 to 60 days. In the 9 cases, all heavy infections, so treated Giardia definitely disappeared on the 21st day in 3, and between the 30th and 50th days in 4 ; 1 case is still infected on the 70th day, and 1 case is still under hopeful treatment on the 35th day. In a cat treated in the same fashion, but with a proportionately reduced dosage, the parasites disappeared on the 21st day.

A. A.

DESCHIENS (R.). **Action antiparasitaire des sels de bismuth "per os" et à doses massives dans les infestations à Giardia.**—*Bull. Soc. Path. Exot.* 1923. Dec. 12. Vol. 16. No. 10. pp. 737–741. [2 refs.]

The author, having made experiment on cats and in human cases, finds that bismuth carbonate and subnitrate are fiercely expulsive for Giardia. They must be given in big doses—50 to 60 gm. daily— and the treatment should continue for 1 or 2 months, during which term lurking parasites should be roused every ten days by a stoppage of bismuth and an administration of bile or calomel.

A. A.

KANTOR (John L.). **Lamblia (Giardia) Infection associated with Cholecystitis. Report of a Case treated with Neo-Arsphenamin.**—*Arch. Intern. Med.* 1923. Nov. 15. Vol. 32. No. 5. pp. 693–704. With 1 chart. [34 refs.]

The object of this paper is to show that patients can be cured of Giardia infection by intravenous injection of arsphenamin. Until recently the diagnosis of Giardia infection could be made only by an examination of the faeces, but now by the use of the duodenal tube the active flagellate form of the parasite can be found in the duodenal contents. The action of the drug upon the parasite was first suggested by the work of POMARET, A.,* who showed that the arsenic from this compound is actually excreted in the bile, and this has been recently elaborated by workers in the United States. This fact, combined with the observation that the Giardia in the duodenum are probably derived from similar organisms in the gall-bladder, led to the employment of this drug. Further, when arsphenamin is injected per rectum it behaves in exactly the same way as when given intravenously.

The initial dose should be as large as possible (0·6 to 0·9 gm. neoarsphenamin for an adult). Apparently these large doses are sometimes followed by severe reactions; therefore comparatively small "desensitizing" doses of 0·2 gm. should be given. If no untoward effects occur within an hour, the rest of the initial dose may be administered. One case is here recorded in which after three doses of the drug no more parasites were found, either in the washings of the duodenum obtained by means of the duodenal sound, or in routine examination of the stools, for a period of six months.

P. H. M-B.

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* La Médecine, 1920, Vol. 2, p. 123.

FELSENREICH (G.) & SATKE (O.). **Ueber Cholangitis durch Lamblia intestinalis.**—*Virchow's Arch. f. Path. Anat. u. Physiol.* 1923. Vol. 245. pp. 364–386. With 3 figs. [37 refs.]

This long paper, based on continuous observation of 8 cases, supports the view that *Giardia intestinalis* inhabits not merely the duodenum of its host but also the bile ducts and gall bladder. What the authors bring forward as conclusive evidence in favour of the liver argument is the abundance in clear drawn duodenal juice of inspissated mucus in the form of elongate branching membrane-like fragments and casts (Gallezylindern). The authors regard Giardia as pathogenetic not merely by absorption from the epithelial cells to which they adhere, but also by various troubles—real as well as subjective—referable to the liver and gall-bladder. For treatment they recommend neosalvarsan.

A. A.

SIMON (M.) **Ueber die Häufigkeit der Lamblieninfektion im Rheinlande.**—*Cent. f. Bakt.* I. Abt. Orig. 1924. Feb. 15. Vol. 91-No. 5. pp. 309–314. [11 refs.]

Examination of the stools of 137 persons in Bonn revealed *Giardia intestinalis* in 23·4 per cent.; 77·4 per cent. of the persons examined were under 15 years old, and in them the percentage of infection was 27·4 per cent.; the youngest instance of an infection was an infant of nine months. In one-third of the cases there were no symptoms. In the other two-thirds there was some history of intestinal disturbance, but mostly either of a trifling kind or long antecedent and not persistent. Any case of true Giardia dysentery was not observed. The Giardia infection was relatively frequent in tuberculous individuals.

A. A.

BRANDT (W.). **Ueber Balantidien-Enteritiden und ihre Therapie.**—*Deut. Med. Woch.* 1923. Nov. 16. Vol. 49. No. 46. pp. 1437–1438.

The author has seen three cases of Balantidium enteritis in his clinic during this year. The interest of the paper centres in the treatment of this intractable condition, the history of which he reviews. He found quinine enemata, 1½ grm. of quinine hydrochloride in 1½ litres to be effective, and in another case ipecacuanaha still more so. This was given in the usúal way in 1 gm. doses daily, and he thinks that it is a specific for *Balantidium coli.*

P. H. M-B.

SPRUE.

BASTEDO (Walter A.) & FAMULENER (L. W.). **Tropical Sprue. A Critical Study of Cases.**—*Jl. Amer. Med. Assoc.* 1923. Dec. 22. Vol. 81. No. 25. pp. 2102–2108. With 1 text fig. [48 refs.]

One of the authors has seen thirteen cases of sprue in New York. In five, in which extensive mycologic studies were carried out, the blood picture was that of a secondary anaemia. In the patients who died the colour index was high and the blood showed the characteristics of pernicious anaemia. Only two cases, one fatal, showed a leucopenia. The blood pressure was regularly low—the systolic ranging between 80 and 110, the diastolic between 52 and 80. Indican was present in the urine, but no urobilin. Analysis of the gastric contents showed the acidity curve to be within the normal limit, while in the two fatal cases a lower reading was recorded. Trypsin tests on the faeces and duodenal contents showed this pancreatic ferment to be present. Bile pigment was regularly present in the stool in their cases; the reaction was acid, but sometimes alkaline. They were unable to substantiate any relation between the reaction and the presence or absence of indican in the urine. The dried faeces showed fat content varying from 16·7 to 38 per cent. Examination with the sigmoidoscope revealed nothing abnormal in 6 cases. X-ray examination showed dilatation and sluggishness of the lower end of the ileum.

As regards the etiology, the yeasts of the genus *Monilia* isolated from the faeces were compared with stock cultures obtained from ASHFORD. In no instance were they able to confirm the sugar reactions said to be characteristic of *Monilia psilosis*. No liquefaction of gelatine was produced, nor the inverted pine-tree growth in stab cultures. They obtained Monilia in 4 to 5 of their own cases, but in no single instance did these agree in their reactions, nor with those obtained from ASHFORD. Monilia vaccines obtained from the Hygienic Laboratory produced no effect in three severe cases. Their investigations on *Streptococcus viridans* were also negative.

The authors are of the opinion that the emaciation, diarrhoea and stomatitis of sprue are indicative of a deficiency disease, and they have come to speculate upon the existence of a possible common factor in pellagra and in sprue. They call attention to the wide geographical distribution of sprue, as illustrated by their cases, and they suggest that possibly an infection with Monilia may be the precipitating cause of the disease, but they consider that ASHFORD's claim for the specificity of *Monilia psilosis* rests on slender foundation.

P. H. Manson-Bahr.

BRAMWELL (Byrom). **Sprue and Pernicious Anaemia.**—*Brit. Med. Jl.* 1924. Mar. 1. pp. 365–366. [1 ref.]

The author records his impressions of clinical similarity between some cases of sprue and pernicious anaemia. In sprue anaemia may be very marked and may present the characteristic features of pernicious anaemia. In both diseases the blood-destruction appears to take place in the portal circulation, but in pernicious anaemia there is no extreme emaciation, as in sprue; in the former, as pointed out by HURST, there is achlorhydria. In pernicious anaemia, as in sprue, the mouth and tongue lesions are part and parcel of those in the gastro-intestinal tract. In two cases of sprue there was found at autopsy and described by Prof. MUIR profound atrophic changes in the voluntary muscles; these took the form of great proliferation of the nuclei of the sarcolemma and degenerative changes in the fibres. Similar changes were subsequently discovered in a third man who had no symptoms of sprue and who apparently died of nicotine poisoning.

Bramwell suggests that parathyroid extract should have a trial in pernicious anaemia.

P. H. M-B.

PROCEEDINGS OF THE ROYAL SOCIETY OF MEDICINE. (Sect. Trop. Dis. & Parasit.) 1924. Feb. Vol. 17. No. 4. pp. 11-25.—**Discussion on Sprue and Coeliac Disease.** (ROGERS (L.) & others.)

ROGERS reviewed the generally described pathological changes in sprue and their bearing on the analyses of the gastric and intestinal contents. Hill diarrhoea he regards as a physiological deficiency of intestinal digestion, but thinks that it predisposes towards the development of true sprue. With reference to the part played by the vitamins in sprue, he thinks there is a diminished absorption of these substances due to intestinal atrophy.

MILLER discussed Coeliac disease in children, and thinks that it has nothing in common with sprue, for the following reasons:—

The first symptoms are always seen in childhood; it does not persist to adult life.

The patient grows in a normal manner and keeps free from symptoms when he subsequently takes a normal diet. The disease is never fatal and never occurs in epidemic form.

The primary factor appears to be digestive fault leading to malabsorption of fat. The faeces bear a rough resemblance to those of sprue, but the tongue is never ulcerated.

Other participators in the discussion produced no new theories or facts. The paper by SCOTT on recent investigation of calcium metabolism has recently been reviewed. MANSON-BAHR believes the essential pathological lesion in sprue to be an ulceration of the small intestine.

P. H. M-B.

SCOTT (H. H.). **The Nature and Treatment of Sprue.**—*Brit. Med. Jl.* 1923. Dec. 15. pp. 1135-1137. [1 ref.]

An account is given of the case, two years' study of which formed the basis of the author's recent but already well-known method of treatment by parathyroid. The large pale stools showed a relative excess of fatty acids and a relatively large excretion of calcium; there were troublesome carpopedal spasms such as are associated with calcium deficiency. The flatulence, acidity and diarrhoea, aphthae, languor, loss of weight, might be attributed to intestinal intoxication. These considerations led him to the trial of parathyroid, which has a two-fold function: the regulation of calcium metabolism and detoxication, in particular, of poisons of intestinal origin. Some improvement was produced by the use of calcium lactate; it was transitory, but when parathyroid was added " a wonderful change took place. Developed aphthae rapidly healed, commencing ones, as sore papillae and tender spots, receded without becoming aphthae, the flatulence was diminished, the stools became fewer and smaller, the colour began to return, and the general sense of well-being was regained. Within so short a time as a fortnight all the more acute symptoms had disappeared; food was increased, calcium was stopped, and in five weeks the patient was on ordinary diet. The parathyroid was gradually left off, and in six weeks from its first employment was stopped altogether. Nearly eleven months have gone by and he has lived a normal life, working hard Sundays and weekdays, paying no regard to diet, taking alcohol on occasion, and has not had a day's illness since. This is not altogether an exceptional case. I have records of other patients who have done nearly, some quite, as well; one even better."

One of two conditions appears to be antecedent of sprue: either the fats are in excess in the diet which leads to the formation of calcium soaps, with excessive excretion of calcium in addition to intestinal intoxication, or there is excess of protein with intestinal toxin formation. "In both, the parathyroid detoxicating function is overburdened, with a resultant disorganisation of its calcium-regulating function, while there may be in addition diminished calcium absorption. Both functions, therefore, of these glands are interfered with." Calcium is normally present in the blood in two forms, the ionic or free, and the combined or coagulative. In calcium deficiency the relation between these forms is upset, the blood after clotting contains calcium in the combined form and there is then relative deficiency of ionized calcium. The calcium values in sprue estimated by VINES before and after treatment are shown in the table.

Since the first case was reported Scott has had word of the treatment of eight cases in the Far East, all of whom had been under treatment by the usual methods for 1½ years or more. In one of these a complete cure was effected in five weeks.

Table of Calcium Contents of Blood Normal and in Cases of Sprue.

	Free Ca.	Combined Ca.	Total in mg. per 100 c.cm. serum.
Normal (after clotting)	10·7	0·0	10·7
McG. Fairly severe case.			
Before starting treatment ..	6·1	3·8	9·9
After one week	8·1	1·8	9·9
After two weeks (good progress)	10·1	0·0	10·1
H. S. Average case. Not taken on arrival. Weight 118 lb.			
After one week (gained 3¾ lb.) ..	7·0	2·9	9·9
After two weeks (weight 127 lb.)	7·4	2·7	10·1
After three weeks (weight 133¼ lb.)	10·8	0·0	10·8
After four weeks (weight 142¾ lb.)	10·8	0·0	10·8
C. W. Mild case; nine months ill. (Bombay.)			
Before starting treatment ..	8·0	1·9	9·9
After two weeks (to have fish, chicken, potatoes, milk, biscuits, carrots, eggs)	8·9	1·2	10·1
After three weeks (to have meat, beef, mutton, ordinary food). After four weeks, reported himself quite well, 2 lb. above normal weight.	10·4	0·0	10·4

P. H. M-B.

CORNELIUS (Stephen). **Parathyroid in Sprue.** [Letters, Notes, etc.]—*Brit. Med. Jl.* 1924. Feb. 16. p. 306.

A note recording the successful treatment, by parathyroid extract and calcium lactate, of a lady in Bombay with sprue. Her diet, which was restricted to milk, was rapidly amplified, and within ten days the improvement in her general appearance was very striking. no other details are given.

P. H. M-B.

YAWS.

GILKS (J. L.). **Yaws in Kenya Colony.**—*Trans. Roy. Soc. Trop. Med. & Hyg.* 1923. Nov. 15. Vol. 17. No. 5. pp. 277–282. With 8 text figs. and 1 graph.

Yaws is found in all parts of Kenya Colony and Protectorate [a narrow strip of coast] up to 5,000 feet, but more especially in certain specified areas. It is uncommon in the towns, probably owing to European clothing and the conditions of employment of natives. From hospital and survey statistics of a large number of natives in the Fort Hall and Central Kavirondo districts the percentage of infection therein is put at 3·5. It is estimated that 60,000 persons require treatment. Here, as elsewhere, novarsenobillon treatment has had astonishing results. A special yaws camp started in the Kikuyu reserve was attended as follows:—In 1918, 325; 1919, 639; 1920, 657; 1921, 7,401; 1922, 24,233. Financial considerations then caused the institution of a small fee and the run was checked. Fortunately it was possible to replace N.A.B. by the much cheaper bismutho-tartrate of potassium. This is made locally and costs one-tenth of a penny per dose. It has a bismuth content of 54·5 per cent. and differs slightly from trepol. It is stable, easily dissolved and boilable and is injected deeply into the muscles. Care must be taken to avoid stomatitis. Lesions clear up rapidly, but whether cure is lasting is unknown.

It is sought in Kenya to eradicate the disease by treatment of individuals with this drug. Dressers trained in the giving of injections are stationed in yaws centres and supervised by medical officers equipped with motor transport. With the help of the administrative officers and chiefs it is hoped that the majority of the patients will come for treatment.

In the discussion CASTELLANI pointed to the administration of mercury to distinguish in doubtful cases between syphilis and yaws, AUSTEN to the need for study of the flies which are believed to spread yaws, and investigation of their life history with a view to their eradication, near yaws camps at any rate, and HANSCHELL to the absence of yaws from Barbados though it used to be common on that island [see this *Bulletin*, Vol. 6., p. 350]; it is introduced from other islands but does not spread; here is the place for yaws research.

In the photographs are shown some advanced tertiary lesions.

A. G. B.

WINCKEL (Ch. W. F.). **The Framboesia-Problem in the Dutch East Indies.**—*Meded. Burgerlijk. Geneesk. Dienst in Nederl.-Indië.* 1923. Part 3. pp. 213–226. With 6 plates. [12 refs.]

Yaws in Java is chiefly a disease of the low country, but in Sumatra it is frequent on the Batak plateau, at an altitude of over 3,000 feet. In parts of the Dutch East Indies the incidence is variously estimated at 12 to 90 per cent. of the population. Of 643 children examined at Acheen 348, or 55 per cent., were affected. An imposing array of evidence is given of the prevalence of tertiary lesions, the existence of which is doubted by POWELL. Thus, BRUG (1911) in Sumatra in his station records found 532 cases of tertiary syphilis and only 2 of primary and secondary syphilis; the former were shown to be yaws. In Sumba Island KUYER (1922) found syphilis practically non-existent, but 70 per cent. of the population had had yaws and many suffered from periostitis, arthritis and gummata of various organs, besides "pseudoleprosy."

Treatment on a large scale was impossible in the war as salvarsan was not obtainable, but was commenced in 1919. An account is given of the propaganda to get the natives to attend the treatment centres. The author lays stress, as propaganda, on payment by the patients, which he finds has three advantages: hitherto all drugs and dressings had been given away, even to well-to-do patients, but the people now learn that a reasonable return should be made; the control of yaws causes little expense to the Government beyond the salaries of the doctors; by asking payment of those who can afford it the number treated has increased enormously [the reason for this is not apparent to the reviewer, and experience elsewhere has been to the contrary].

Treatment, by intravenous injections of neosalvarsan, 0·45 gram for an adult, is ambulatory, which with stated precautions is comparatively free from risk. The precaution to give injections only to those who need treatment is not easily complied with. Many patients come whose only complaint is pains in the bones ("sakit tulang") and if there are no objective symptoms decision is difficult, for the medicine being regarded by the native as a panacea sakit tulang is often feigned. With good organization and well trained assistants 600–800 injections may be given daily.

The author refers to SPITTEL's book [this *Bulletin*, Vol. 20, p. 263] in which he lays stress on the necessity in Ceylon for home treatment. This would be impossible in the D.E.I. where in a population of 45 millions there is one doctor to 300,000 people. One injection only is given; it is recognized that this is insufficient, but it is all the native wants or will stay for; if lesions return he will come again. His appreciation of the remedy is shown by citations from songs with which HATA was greeted when he visited Java in 1921. From August 1919 to June 1923, 890,000 patients (apart from private cases) have been treated with 300 kilos. of neosalvarsan, for which the people have paid fl. 340,000. The author regards neosalvarsan as the medicine *par excellence* for popularizing western medical science.

Excellent photographs show patients before and after treatment.

A. G. B.

SALM (A. J.). **Quelques notes sur le pian et son traitement à Java.**—*Bull. Soc. Path. Exot.* 1923. Oct. 10. Vol. 16. No 8. pp. 580–582.

Yaws is very common in the Dutch East Indies. The author draws attention to the difficulty of statistical comparisons when some observers regard only the ulcerous forms, while others include the plantar manifestations and others again the tertiaries. In Java the disease is being seriously combated; one injection of salvarsan or neosalvarsan is regarded as sufficient. Patients are classed as non-paying, and as those who pay half a florin, one florin or one and a half florins, respectively, for each injection. In the last three months eight doctors have treated 2,565 patients, of whom 2,217 paid a total of 2,175 florins, leaving a sum of 1,081 florins to be met from State funds. Propagandic posters representing patients before and after treatment, with legends in various tongues, are distributed in native schools, railway stations and headmen's houses.

A. G. B.

WILSON (P. W.). **Observations concerning Yaws in Haiti.**—*U.S. Nav. Med. Bull.* 1924. Feb. Vol. 20. No. 2. pp. 190–196.

Syphilis and yaws coexist in Haiti " in abundance," and if it be true that Columbus brought syphilis from Haiti at the end of the 15th century and that yaws was introduced to that island at the beginning of the 16th century with the first batch of West African slaves the two infections have long coexisted. It is suggested that the African throve in company with the syphilized Indian because he was immunized by yaws.

The author has seen only 19 cases of secondary yaws during 9 months in Haiti but over 200 in the tertiary stage, and he is prepared for the suggestion that many of these were syphilis [a reasonable suggestion if syphilis is " abundant," seeing that there is no certain means of distinguishing these infections in their late stages]. But he has another explanation. For all Haitians yaws is a " disease of shame " to which they can hardly be got to admit, and he suggests that this goes back to the time of the yaws houses instituted by the planters, in which the sufferers were isolated " like lepers." At Jacmel, a coast town, secondary yaws is practically unknown, for the simple reason that a case, as soon as discovered, has to leave the town. No early yaws cases are allowed to remain. In the country the sufferer keeps out of the way of his fellows; he never seeks medical assistance and his treatment consists in daily baths in clear, cold water. The belief is that he must not get well too quickly, and of 17 who were invited to come to the hospital for treatment none turned up. The tertiary patients attribute their condition to anything but yaws.

Of the tertiary yaws lesions the most frequent are those resembling tubercular syphilides with ulceration, then periostitis and osteitis of the bones of the leg with ulceration of the skin and then destruction of the bones of the nose and the hard palate. Twelve cases of sabre-shaped tibia have been observed. Bones involved are the clavicle, scapula, radius, ulna and small bones of the hand and foot. Humerus, femur, ribs and vertebrae seem to be usually exempt. Crab or foot yaws is common, but this is a late secondary phenomenon and is recognised as framboesial. The author finds that 3 weekly salvarsan injections are needed for tertiary cases and that there is little clinical improvement after a fourth. He suggests that a relatively painless method of giving an effective arsenical subcutaneously is much needed and that sulpharsphenamine may fill the bill. Treatment in Haiti must be taken to the patient. Here, as elsewhere, yaws seems to be a disease of the country, syphilis of the town. [For an account of yaws in another part of the same island, see this *Bulletin*, Vol. 20, p. 172.]

A. G. B.

KNOWLES (R.), CHOPRA (R. N.), GUPTA (J. C.) & DAS GUPTA (B. M.). **Notes on Some Cases of Framboesia.**—*Indian Med. Gaz.* 1923. Oct. Vol. 58. No. 10. pp. 470–473. With 8 figs. [2 refs.]

Twelve cases of yaws from a village in the Cachar District of Assam [where POWELL studied the disease for ten years, this *Bulletin*, Vol. 20,

p. 835] were sent to the Calcutta School of Tropical Medicine for study and treatment. Full particulars of each are given in a table. The duration of the disease varied between 2 and 6 years. In the study of the lesions 4 to 7 films were examined by dark ground illumination or by staining. In all but two *Spironema pertenue* was found in abundance; 25 examinations from 20 lesions yielded 22 positives and 3 negatives. On the other hand, the Wassermann tests, by Major LLOYD, Imperial Serologist, gave 5 positives, 4 incompletely negative, and 3 negative. It is concluded that search for the parasite by dark ground illumination is a better diagnostic procedure than the serological test. The capillary pipette method was useless.

"The best technique is that advocated by Ashburn and Craig (1907), and is as follows. The surface of the sore is cleansed with a cotton wool swab soaked in warm water and then allowed to dry. The lesion is now gently scraped with the blunt end of a glass slide. If any bleeding occurs it must be checked by pressure. The final exudate is serum only, which is usually found under dark ground examination to be rich in actively motile *S. pertenue,* 4 to 5 per field. Dark ground examination gave a far better percentage of positive findings than did examination of stained films. With regard to the latter, films intended for staining by Fontana's method should be fixed by methyl alcohol, before the mordant is used. The results are far better and the spirochaetes more easy to find after such preliminary fixation."

Attempts at cultivation were made in Noguchi medium, in Row's haemoglobin saline medium and by ASHBURN and CRAIG's capillary tube method. All failed. Four *Macacus rhesus* monkeys and four Belgian hares were inoculated, the former in the abdomen and eyebrow, the latter in cornea and testis. Strains of virus from four patients were used. All inoculations were negative. Two of the monkeys developed eyebrow nodules like yaws but *S. pertenue* could not be found in them.

Sulfarsenol and silver salvarsan were used in treatment. They were of about equal efficacy, one to three injections being required. Sulfarsenol is cheaper and can be given subcutaneously as well as intravenously. Subcutaneous injection of this drug is not followed by a fall of blood pressure. Among subsidiary findings—each patient was submitted to routine examination—eleven out of the twelve had malarial parasites, all three varieties, quartan predominating.

A. G. B.

BEURNIER & CLAPIER (P.). **Notes sur quelques méthodes actuelles de traitement du Pian.**—*Bull. Soc. Path. Exot.* 1924. Jan. 9. Vol. 17. No. 1. pp. 94–101.

The authors discuss the treatment of yaws in tropical Africa under the headings (1) Intravenous injection; (2) Subcutaneous and intramuscular injections; (3) Treatment by mouth.

(1). They state that intravenous injections are now readily accepted by all native peoples. For reasons given this channel has its drawbacks, for it has to be remembered that prophylactic treatment in Africa must be entrusted, at least partly, to African assistants. Novarsenobenzol or "914" has the chief vogue. It is rapid in action but changes somewhat in the tropics, varies in the colour of the solutions, which makes one suspect the constancy of its action, and is to some extent toxic. Care must be exercised in its use; doses should never exceed 0·6 to 0·75 gm. and should at first be small; the urine should be examined for albumen before the first and after each injection.

" 189 " has no advantages over " 914 " and tartar emetic, though its dosage, etc., is discussed, is clearly not favoured.

(2). " 914 " can be given thus if the doses are very small, but lymphangitis is frequent and abscesses not rare.

" 189 " given every other day in a freshly made 10 per cent. solution in boiled and cooled water gives excellent results, 0·3–0·75 gm. for a child, 1 gm. for an adult ; 4–6 injections suffice. With intervals of 48 hours toxic symptoms may develop if these doses are multiplied ; with 72 hour intervals recovery is slow. Sulfarsenol is good but the authors have little experience of it.

Bismuth—Case histories are given of 4–8 cases treated severally and successfully with Muthanol, Bischloral, Neo-trepol, Quinby, Spirillan, with no details of the make up of these substances. The action of all seems to be remarkably good. Apparent cure is obtained in less than 15 days. No serious drawback was noted and little pain. Often the general state and the weight improved. They think that these injections could be entrusted to native hospital assistants of average skill.

(3). Castellani's mixture in the authors' hands has caused the disappearance of lesions in 16 and 17 days. It has the advantage that its ingredients are to be found in every dispensary.

A fresh solution of " 189 " in boiled water acts well. Recovery in ten days may be obtained with the doses recommended for injection, but to avoid diarrhoea medication at 3 day intervals is better though cure is delayed.

Stovarsol or " 190," the acetyl derivative of the last, is very effective. It is put up in whitish tablets of 0·25 gm., dissolving readily in water. The authors have a large experience of its use. One gm. is the dose for an adult weighing 50 kilos or more. It is given every 48 hours in the morning before food for not more than 8 times for an adult. If lesions are still present, or diarrhoea is complained of, wait a week, and resume with smaller doses, but lesions usually disappear between the 10th and 15th day. Treatment by mouth is unsuited for small children.

Four cases were treated successfully with " bismhydral."

The conclusions to which the authors came are that large scale treatment by intramuscular or subcutaneous injection and by mouth is alone practical in Tropical Africa. The salts of bismuth by intramuscular injection are strongly indicated and by mouth stovarsol given with prudence ; these two are the authors' choice.

A. G. B.

HOWARD (Robert). **A Note on the Treatment of Yaws with Sodium Bismuth Tartrate.**—*Trans. Roy. Soc. Trop. Med. & Hyg.* 1923. Dec. 13 & 1924, Jan. 17. Vol. 17. Nos. 6 & 7. pp. 437–438.

The sodium bismuth tartrate was received from Messrs. Howards & Sons. For an adult the author dissolves 6 grains in 40 minims of distilled water and injects deeply into the gluteal muscles. About 100 cases were treated, mostly in the secondary stage, as out-patients with two injections at a week's interval. Stomatitis was seen only once, in a patient with pyorrhoea. The results are nearly equal to those of neokharsivan, but the bismuth salt is much cheaper, less than a farthing a dose, and is more stable.

A. G. B.

BAERMANN (G.). **Die schützende Wirkung von "Stovarsol" bei Framboesia tropica.** [Stovarsol as a Prophylactic in Yaws.]—*Arch. f. Schiffs- u. Trop.-Hyg.* 1923. Aug. Vol. 27. No. 7. pp. 229–234.

Stovarsol, or "190," is the sodium salt of acetyl-oxyamino-phenylarsenic acid and is sold in tablets of 0·25 gm. These are swallowed half an hour before meals either dry or dissolved in water; one gram may be taken daily for 3–5 days. Previous experiments by LEVADITI and others, on man and guineapigs inoculated with syphilis, are cited; the results were so good that the author decided to test the preventive action of the drug in yaws, with the incidental advantage that the results of infection are much less serious than with syphilis.

On December 21 a typical "gulden-sized" framboesial nodule was removed from a Javanese with a typical yaws eruption, in the serum of which *Spironema pertenue* were seen by dark field illumination. From this a healthy European volunteer was inoculated. His Wassermann reaction tested by three methods was negative. A patch on his leg was scarified till blood-strained serum issued and the upper surface of the excised nodule was rubbed in for two minutes. The lesion was air-dried and not bandaged. An hour later 3 tablets of stovarsol were swallowed, and on the three succeeding days 4, or 3·75 gm. in all. The scarifications healed in 6 days and up to February 25 the skin remained normal, there was no gland enlargement and three Wassermann tests at 14 days interval were negative. On the same day a *Macacus nemestrinus* of 5 kilos was similarly inoculated. He received one tablet on the following, 2nd, 3rd and 4th days, 1 gm. in all. He also remained without symptoms. On January 26 he was reinoculated and in 14 days developed a typical primary lesion in which spironemata were found. A control *M. nemestrinus* was inoculated on the same day as the other monkey and man, but was not treated. In 14 days a typical framboesial nodule developed containing spironemata. A second inoculation on January 22 was without effect.

The experiment shows, writes the author, that stovarsol in a dose of 3·75 gm. given within 4 days prevented infection by an intensive inoculation with spironemata of yaws in an European of 66 kilos. Apart from slight nausea on the fourth day the patient experienced no unpleasant effect. The author advises further tests of stovarsol as a preventive of syphilis and yaws. In tertian malaria no preventive action of stovarsol could be shown.

A. G. B.

LEGER (André). **Le Stovarsol dans le Pian.**—*Bull. Soc. Path. Exot.* 1923. Nov. 14. Vol. 16. No. 9. pp. 635–636.

The excellent results obtained with stovarsol or "190" in syphilis and in amoebic dysentery (this *Bulletin,* Vol. 20, p. 712) and the fact that it is given by the mouth induced the author in Annam to try it for yaws. Ten patients in whose lesions the presence of *Spironema pertenue* had been demonstrated received the drug, 3 or 4 tablets of 0·25 gm., dissolved in water, daily for ten days. There were no symptoms of intolerance and the curative action was as rapid as that of arsenobenzol. From the 2nd or 3rd day the lesions dried up forming a scab under which cicatrization took place and the general condition improved remarkably. The author concludes that the merits of stovarsol are so great that it should come into use for prophylaxis.

A. G. B.

TANON & JAMOT. **Le traitement du pian par le stovarsol.**—*Rev. Méd. et Hyg. Trop.* 1924. Jan. Vol. 16. No. 1. pp. 18–23.

These authors find that stovarsol is an excellent remedy for yaws. It is quickly absorbed and well tolerated and cures at least as rapidly as neosalvarsan. Patients can be treated at their own homes. Two cases that had resisted neosalvarsan yielded to stovarsol. They give the drug to adults thus:—1st day, 2 tablets; 2nd, 3; 3rd, 4; 4th, none; 5th, 4; 6th, 3; 7th, 2, and the following week a tablet every 3 days. By the 5th day the lesions are completely dried up. Details are given of five cases.

A. G. B.

BENIGNO VELASCO (C.). **Contribución al estudio clínico del pián.**—*Repert. de Med. y Cirug.* 1921. Sept. Vol. 12. No. 12. (No. 144.) pp. 647–675.

ERNST (John R.). **A Case of Yaws.**—*Proc. Med. Assoc. Isthmian Canal Zone.* 1920. Jan.-Dec. Vol. 13. Pts. 1 & 2. p. 98. With 1 plate.

GISLEN. **Le pian (Framboesia tropica).**—*Arch. Méd. Belges.* 1923. June. Vol. 76. No. 6. pp. 464-472. With 2 figs.

SLEEPING SICKNESS.

SCHWETZ (J.). **La lutte contre la maladie du sommeil dans les districts du Kwango et du Kasaï (Congo belge), en 1920-1923.**— *Bull. Soc. Path. Exot.* 1924. Jan. 9. Vol. 17. No. 1. pp. 76-86. With 1 map. [2 refs.]

The author recalls that, after spending several months in the Kwango district, he published a report and pressed for the appointment of a Commission to investigate and treat sleeping sickness in that region [this *Bulletin*, Vol. 15, p. 381]. This Commission was appointed and Schwetz put in charge, and the present paper is a record of the work done during the first three years of its labours, viz., 1920-1923. The mission consisted of 3 doctors, 3 European sanitary inspectors and 30 native hospital attendants. Hardly had the work commenced before two members, a doctor and a European sanitary inspector, contracted sleeping sickness, and this reduced seriously the European staff during 1921. During 1922, the European staff was greatly strengthened and consisted of 5 doctors and 5 sanitary inspectors.

The district of Kwango and the adjacent part of Kasaï is practically unoccupied and unruly, and this proved, as the author previously surmised, a great obstacle to success in anti-sleeping sickness work. The population is fairly dense, but the people live widely dispersed in hamlets or even in isolated huts. On the arrival of the European, they hid themselves; no census of the population was available and the maps were quite inadequate.

It was consequently necessary to begin by concentrating the people into proper villages, by making a census and by preparing maps, and this work compelled the mission to limit its activities during the first year to an area of about 10,000 square kilometres and to the examination of some 70,000 natives. Another difficulty experienced was that of obtaining and training a sufficient number of native hospital assistants. Many of these were obtained and trained locally and by the end of 1922 the mission possessed 40 to 50 assistants capable of giving injections, all except 5 trained by members of the mission. During the first year only intramuscular injections of atoxyl were given, but later, as the assistants became more skilled, intravenous injections of atoxyl and emetic were administered.

The author next refers to the difficulties of diagnosis and quotes at length from his previous paper on this subject [*loc. cit.*]. The microscope was only used in special circumstances, and diagnosis, as a general rule, depended on gland palpation. Re-examination after treatment was also limited to gland palpation. If a treated patient was found on re-examination (in general a year later) still to have enlarged glands, he was considered not to be cured, even though his general state was good and trypanosomes could not be found. On the contrary, if the patient was in good condition and did not exhibit enlarged glands, he was considered to have certainly benefited from treatment, although not necessarily to be definitely cured.

Microscopic examinations were made in the case of 86 treated cases —half of which had been diagnosed before treatment by the microscope and the other half by gland palpation. The examination of gland juice was negative in every instance, but trypanosomes were found by the blood centrifugation method in three cases, all of whom had typical glands; in 9 others with typical glands the blood examination was negative. Hence, from the prophylactic point of view, the author concludes that their real results are better than their figures, based on gland palpation, indicate. The curative result is, however, probably less satisfactory, as the cerebrospinal fluid was found to be altered in all the 86 cases, but it is noted that no examination of this was made before treatment.

The author at first attempted to work simultaneously in two or three territories, but shortage of staff prevented this, and until the end of 1922 he had to confine himself to a single territory, which he subdivided into several sections, each of which was put under the charge of a doctor and sanitary inspector. He notes that in the Belgian Congo there are 22 districts and that each district is divided into 6, 8, 10 or 12 territories, which, of course, vary in size, but approximate roughly to 100 km. × 100 km. Details are given of the method of work in the several sections—the examination of the population, the recording of cases, the issuing of tallies, the treatment of patients, and the arrangements made to ensure the re-visiting of the villages at regular intervals. The dose of atoxyl administered was about 1 gm. for an adult and ·5 gm. for a child, and the course given was 10 injections during a period of 2½ to 3 months. Later, when the atoxyl-emetic treatment was commenced, the length of the course of treatment did not exceed 1½ months.

During the first three years, the mission examined 8 territories with a population of 550,000 persons and treated 45,000 patients. Of the 8 territories only 3 had been re-examined previous to the author's departure in June 1923, but the others are in course of re-examination; of the three re-examined, two have been done once and the third (Kikwit) twice. During re-examination a second course of treatment (10 injections) is given to all cases previously treated, even to those apparently cured, and a complete course of treatment is also given to any new cases discovered. At Kikwit, on the third examination a third and second course of treatment was given to cases discovered during the first and second examination, respectively, and a first course to new cases. The total result is that about 200,000 natives have been examined twice and 20,000 patients treated twice; and 100,000 natives have been examined three times and 10,000 treated three times. In all, 850,000 examinations have been made and 75,000 courses of treatment, comprising 750,000 injections, given.

In a table the result of the examination and re-examination of the 8 territories is given. It was found that re-examination of Kandale showed 1 per cent. of persons infected as compared with 5·5 per cent. at the first examination: at Bulungu the figures were, respectively, 3·3 per cent. and 12·2 per cent.; and at Kikwit 12·8 per cent. at the first examination, 9 per cent. at the second and 6 per cent. at the third; the interval between the examinations was one year. The author remarks that the relatively poor results obtained in Kikwit are to be explained by the special difficulties of all kinds which were encountered during the first and second examination.

W. Yorke.

VAN DEN BRANDEN (F.) & VAN HOOF (L.). **Fonctionnement du Laboratoire de Léopoldville pendant l'année 1922.**—*Ann. Soc. Belge de Méd. Trop.* 1923. Nov. Vol. 3. No. 2. pp. 157–180. With 6 plates & 1 graph.

During 1922, 9,381 men, women and children (residents, crews of ships and travellers) were examined at Leopoldville as regards trypanosomiasis; the number of gland punctures made was 2,569, and the number of blood examinations by the triple centrifugation method was 1,016: these examinations resulted in the discovery of 196 cases of infection. The number of natives examined belonging to the Leopoldville district was 2,435, and 42 (1·7 per cent.) were found to be infected. At Madimba 17,000 natives were examined and 245 cases of the disease found.

W. Y.

BULLETIN DE L'ACADÉMIE DE MÉDECINE. 1923. Nov. 20. Year 87. Vol. 90. 3rd Ser. No. 39. pp. 338–342.—**I. Sur un travail de M. Augagneur intitulé : Mouvement de la population en Afrique equatoriale française. Influence de la maladie du sommeil ; présenté au nom d'une Commission composée de : MM.** Louis MARTIN, BRUMPT **et** Léon BERNARD **rapporteur.**

It is generally accepted that equatorial Africa is being rapidly depopulated and that trypanosomiasis, spread as the result of colonization, is the principal cause of this depopulation; the disease acts partly by the mortality which it causes and also by the decrease in the number of births for which it is responsible. AUGAGNEUR, who is not only a medical man, but also Governor General of French Equatorial Africa, has re-investigated this problem and the results of his enquiries do not support this general belief. He first concerned himself with the question whether the supposed depopulation has actually taken place. In 1921, AUGAGNEUR made as careful as possible a census of the population of French Equatorial Africa and found a total of 2,854,948 persons. The official estimate in 1913 was between 8 and 9 millions and the author concludes that if these figures were exact, the depopulation would have proceeded with such rapidity that the entire race would have disappeared within three years. AUGAGNEUR is of opinion for the following reasons that the population was never numerous.

1. The soil is poor and all the vegetables used are imported.
2. The improvidence and apathy of the natives prevent them from cultivating the ground and hence there are frequent famines and constant malnutrition.
3. The absence of hygiene and of clothes; and the extreme frequence of acutely fatal pulmonary diseases, disorders of metabolism, severe enteritis, and intestinal worms.
4. Slave raiding by the coast negroes and in the interior by the Arab Sultans of Darfour and of the Ouadaï carries off the young and robust, and the reproductive element.
5. Incessant inter-tribal warfare.
6. Sleeping sickness.
7. Malaria.

These factors were always at work preventing increase in the population. Under the energetic influence of the Administration, the natives are compelled to cultivate the ground and famines are rare and less severe. The intestinal infections often related to harmful diet have, with the provision of proper food, lost part of their gravity. The clothing of the natives has only improved among those in contact with

Europeans, and the pulmonary diseases are less extensive than formerly. Slavery and inter-tribal warfare have completely disappeared and malaria is being dealt with. There remains trypanosomiasis, to which is attributed a preponderating part in producing mortality in Central Africa. AUGAGNEUR has analysed the numerous reports relating to sleeping sickness in the Colony and has reached the conclusion that it is at the moment impossible to determine the influence of the disease on the death rate and its effect on the total population.

W. Y.

HUOT (N. L.). **Rôle capital des conditions d'existence de l'indigène de la forêt équatoriale et, en premier lieu, du facteur alimentaire, dans les variations de gravité de l'endémie trypanique.**—*Ann. de Méd. et de Pharm. Colon.* Paris. 1923. May-June-July-Aug. Vol. 21 [22 *sic*]. No. 2. pp. 163-166.

During sleeping sickness work in the Doumé district of East Cameroons in 1921-1922, the author found endemic sleeping sickness presenting two very different forms: the one mildly endemic, 5 to 10 per cent. of the population infected, but mainly in apparent good health with little of the later stages of the disease and few deaths, not influencing appreciably the general death rate; the other in foci clearly delimited, of a violently epidemic type, 50 per cent. of the population infected, much somnolence and heavy mortality. On comparing the conditions obtaining in the districts where the two types of the infection occur, it is found that in the mildly endemic areas the people are prosperous and well fed, and the conclusion is reached that where the population is properly fed those infected with sleeping sickness *do not die*. On the contrary, in the areas severely attacked it was always found that disturbed conditions existed, villages were abandoned, and the population dispersed into the bush and lived a semi-nomadic existence; cultivation of crops was inadequate and the people were ill fed In all the heavily infected districts political disorganization- the result of various factors, such as exactions of the chiefs, racial rivalries, truculence of certain sections of the population, failure to adjust taxation—has invariably preceded the epidemic and is not the consequence of the epidemic, but the cause of it.

The author comments on the rapidity with which the physique of the native changes when his diet becomes insufficient. His food consists almost exclusively of carbohydrates. The proportion of fats varies considerably; it is abundant in the oil palm districts, but deficient where these are absent. In practically the whole equatorial forest zone, the native eats meat but exceptionally; his food is almost exclusively vegetarian and he only remains in good health when he is able to compensate quantitatively its poor quality. Finally, the poor quality of the soil is rapidly impoverished by the cultivation of crops, and it is frequently necessary to change the site of the plantations, which means continual deforestations and clearing. If, for any reason, this essential work is neglected, food scarcity threatens, and inevitably the under-feeding which results will prepare the ground for the outbreak of a severe epidemic of trypanosomiasis.

The paper concludes with certain recommendations which the author bases on these considerations.

W. Y.

GEORGELIN. **Maladies endémiques et endémo-épidémiques constatées au Gabon pendant l'année 1921-1922.**—*Ann. de Méd. et de Pharm. Colon.* Paris. 1923. May-June-July-Aug. Vol. 21 [22 *sic*]. No. 2. pp. 209-215.

At the Libreville laboratory during the year 1921–1922 there were examined for sleeping sickness 2,529 natives and 99 were found to be infected. In Sector 10 the number of natives examined was 9,261, and 143 were found to be infected. Up to 30th September 1921 there had been recognised and treated 394 cases, and by 30th September 1922 the number had risen to 567. The patients were not only given sterilising injections from the point of view of prophylaxis, but were treated regularly, and 226 were admitted to hospital; 22 died during the year but others are greatly improved.

CLAPIER visited the Woleu-N'Tem district for a period of more than three months and found tsetse in most of the villages; the inhabitants are especially bitten whilst engaged in fishing, and this explains the large number of cases among women. Sixty-three cases were found in this district among the 1,792 persons examined.

During the year, CLAPIER has conducted observations on the therapeutic value of oxyaminophenylarsinic oxide (189). In doses of 2 to 4 cgm. per kilo of body weight the drug causes disappearance of parasites from the blood and glands within 10 hours. With intermittent treatment sterilization may persist for 4 months or more after cessation of treatment, but relapses are not rare in both early and late cases even after large doses.

In the Haut-Ogooué district 13,695 natives were examined and 2,513 new cases found.

W. Y.

GAMINARA (Ángel). **Estudio experimental sobre** *Schizotripanum cruzi* **y enfermedad de Chagas en el Uruguay.** [Experimental Study of *Schizotrypanum cruzi* and Chagas' Disease in Uruguay.]—*Anales de la Fac. de Med.* Montevideo. 1923. Mar.-Apr. Vol. 8. Nos. 3-4. pp. 311–359. With 7 plates. [93 refs.]

Although Uruguay has a temperate climate certain tropical diseases are met with; among these is Chagas' disease. *Schizotrypanum cruzi* is widely distributed in South America owing to the prevalence of its intermediate hosts, and at least two species of these are found in Uruguay, mainly in the north-east and centre of the county, viz., *Triatoma infestans* Klüg, 1834, and *T. rubrovaria* Blanch., 1843.

The Uruguayan Triatomas were found to be infected with intestinal flagellates corresponding in all respects to the developmental forms of *Schizotrypanum cruzi* in the bug as described by CHAGAS. Inoculation of experimental animals with these flagellates resulted in infections indistinguishable from those produced by *Schizotrypanum cruzi*. The infected animals showed in their cardiac and skeletal muscles the typical leishmania-like forms of the parasite and as a result of his studies the author concludes that the parasite is identical with *S. cruzi*.

Although the trypanosome has not as yet been found in human beings, probably because the blood of suspected cases has not been examined in the acute stage, nevertheless, the myxoedematous, cardiac and nervous types of the disease have been recorded clinically. (The paper is illustrated by coloured plates and microphotographs which indicate clearly that the morphology of the parasite is that of *Schizotrypanum cruzi*.)

W. Y.

SOTO (Jaquin). **[Un nuevo caso de tripanosomiasis en El Salvador.]**—*La Clinica.* San Salvador. 1922. Vol. 1. Part 6. No. 5, 6 & 7. [Summarized in *Arch. f. Schiffs- u. Trop.-Hyg.* 1924. Feb. Vol. 28. No. 2. p. 78.]

A second case of human trypanosomiasis has been found by SEGOVIA in Salvador. The parasite, as in the first case, resembled *T. cruzi.* The clinical picture in both cases was that of chronic malaria. It is possible that the disease is a new one and that morphological differences may exist between the parasite and *T. cruzi*; further observations are to be made. W. Y.

VAN DEN BRANDEN (F.) & VAN HOOF (L.). **Résultats de l'observation de malades trypanosomés traités au Tryparsamide "A 63."**—*Bull. Soc. Path. Exot.* 1923. Oct. 10. Vol. 16. No. 8. pp. 606–615. [2 refs.]

The patients in question were treated by Dr. Louise PEARCE at Léopoldville in 1921 (*Jl. Exper. Med.*, Vol. 34, Dec., p. 104; this *Bulletin*, Vol. 19, p. 136).

The first portion relates to the treatment of cases of trypanosomiasis in which the cerebrospinal fluid was normal, and the results obtained in a series of 20 such cases are given in detail. The duration of sterilization obtained by a single dose of from 2 gm. to 3 gm. of the drug varied from 17 days to 13 months: those who relapsed were re-treated. All the twenty cases have apparently been cured and the total amount of the drug given to them varied in the individual cases from 2 gm. to 54 gm. The observation period from the end of treatment varied from 6 months to 2 years and 7 months.

Details are given of the treatment of 35 cases in which the cerebrospinal fluid was altered. In 11 cases the lymphocytosis decreased as the result of treatment, as is shown in Table I.

TABLE I.

Lymphocytosis before treatment.	Doses received.	Lymphocytosis after treatment.
1. 17·5 to the cmm.	9 g.	7·5 to the cmm.
2. 70 to the cmm.	65 g.	75 [? 7·5] to the cmm. large mononuclears.
3. 35 to the cmm.	46 g.	8·7 to the cmm.
4. 12·5 to the cmm.	24 g.	6·5 to the cmm.
5. 305 to the cmm. large mononuclears and mulberry cells.	52 g.	6·8 to the cmm.
6. 247 to the cmm. large mononuclears and mulberry cells.	62 g. 500	5 to the cmm. large mononuclears.
7. 387 to the cmm.	32 g.	5 to the cmm. large mononuclears.
8. 15 to the cmm.	19 g.	9·3 to the cmm.
9. 117 to the cmm. large mononuclears and mulberry cells.	31 g.	1·5 to the cmm. large mononuclears.
10. 327 to the cmm. large mononuclears and mulberry cells.	51 g.	5 to the cmm. large mononuclears.
11. 19 to the cmm.	16 g.	10·3 to the cmm. large mononuclears.

In three patients the lymphocytosis increased as is shown in Table 2.

TABLE 2.

Lymphocytosis before treatment.	Doses received.	Lymphocytosis after treatment.
1. 7·5 to the cmm.	7 g.	24 to the cmm.
2. 5·3 to the cmm.	12 g.	8 to the cmm.
3. 7·5 to the cmm. large mononuclears.	32 g.	20 to the cmm. large mononuclears.

Three cases, the cerebrospinal fluid of all of which exhibited a high degree of lymphocytosis (viz., 100 to 450 per cmm.), died at the end of their course of treatment, which varied from 32 gm. to 36 gm. of tryparsamide.

In 16 patients the cerebrospinal fluids became normal as regards lymphocytes, as is shown in Table 3.

TABLE 3.

Lymphocytosis before treatment.	Doses received.	Lymphocytosis after treatment.
1. 52 to the cmm. large mononuclears.	40 g.	1·2 to the cmm.
2. 32 to the cmm.	48 g.	1·5 to the cmm.
3. 7·5 to the cmm.	18 g.	1·2 to the cmm.
4. 285 to the cmm. large mononuclears and mulberry cells.	60 g.	2·5 to the cmm.
5. 35 to the cmm.	35 g.	1·8 to the cmm.
6. 22 to the cmm.	47 g.	0·9 to the cmm.
7. 92·5 to the cmm.	48 g.	1·5 to the cmm.
8. 47 to the cmm.	60 g.	1·5 to the cmm.
9. 10 to the cmm.	32 g.	1 to the cmm.
10. 7·5 to the cmm.	7 g.	Normal.
11. 47 to the cmm.	22 g.	0·6 to the cmm.
12. 20 to the cmm.	36 g.	4·6 to the cmm.
13. 15 to the cmm.	40 g.	3 to the cmm.
14. 37·5 to the cmm.	60 g.	2·1 to the cmm.
15. 15 to the cmm.	53 g.	0·9 to the cmm.
16. 20 to the cmm.	19 g.	1·5 to the cmm.

In the last two cases the lymphocytosis fell to practically normal, viz., from 20 per cmm. and 300 per cmm., respectively, to 2·1 per cmm. and 6·5 per cmm. after having received 82·7 gm. and 28 gm. of the drug.

The general summary is that in patients with normal cerebrospinal fluid the number of immediate successes appears to be 100 per cent., but the authors add that they are inclined to believe that they had to deal with a fortunate series of cases. Of those in whom the cerebrospinal fluid was changed, 3 (8·5 per cent.) died rapidly after the end of treatment; 16 (45 per cent.) exhibited 6 months to a year after treatment a normal cerebrospinal fluid, 3 showed an increase in lymphocytosis, in 2 the fluid became almost normal, and in 11 the lymphocytosis diminished appreciably, but the cerebrospinal fluid did not become normal.

The conclusion is that tryparsamide, which can be administered either into the muscle or veins, seems to be the most active arsenical preparation known in the treatment of trypanosomiasis. It, however, unfortunately has the great disadvantage of provoking in certain cases visual troubles and may sometimes produce blindness.

W. Y.

BROWN (Wade H.) & PEARCE (Louise). **Tryparsamide : its Action and Use.**—*Jl. Amer. Med. Assoc.* 1924. Jan. 5. Vol. 82. No. 1. pp. 5–9. [19 refs.].

In this paper the authors have attempted to bring together the essential points bearing on the subject of the action and use of tryparsamide, and to discuss them in a manner that will be helpful to those who contemplate the use of this drug.

Tryparsamide was synthesized by JACOBS and HEIDELBERGER and its biological action studied by BROWN and PEARCE in 1915 (this *Bulletin,* Vol. 15, p. 390), but the first publication did not appear until 1919, and no systematic clinical investigation could be undertaken until 1919–1920, when work was started both in trypanosomiasis and syphilis.

Action on the Animal Organism. Very slight local irritation is produced by subcutaneous or intramuscular injections, and in view of the large arsenic content (25·32 per cent.), the dose which can be administered to laboratory animals by any route is very large ; there is also a comparatively narrow zone of separation between the lethal dose and the dose which produces no apparent functional or organic impairment ; and furthermore, after the administration of a toxic but sublethal dose, all manifestations of intoxication develop promptly, while recovery is both rapid and complete. Doses slightly below the lethal level can be given at weekly intervals over a long period without cumulative toxic effects, but actually with increased tolerance of the organism, so that eventually the dose may be raised to a level well beyond that which is ordinarily fatal. The drug produced a remarkable stimulative effect on the animal organism in both normal and diseased animals ; even small doses lead to an immediate improvement in general appearance, activity and weight of treated animals. The only unfavourable features of the action of tryparsamide noted were an irregular tolerance on the part of different animal species and the occurrence of peculiar nervous symptoms, including amblyopia.

Therapeutic action. The trypanocidal index tested in mice is fairly good, but by no means equal to that of a number of well known substances, such as arsphenamin and neo-arsphenamin, and is distinctly inferior to that of arsenophenylglycin or even arsacetin. While, however, therapeutic tests on mice and rats may give a fairly accurate indication of what may be termed potential trypanocidal activity, they do not necessarily convey any idea of actual curative value, since the disease in these animals is of a wholly different character from that in man or the larger domestic animals ; the rabbit is from this point of view a more satisfactory test animal, since the experimental infection shows practically all the conditions that characterize trypanosome infections in man, including involvement of the central nervous system. Tryparsamide proved to be highly effective in the treatment of infected rabbits. If a drug cures a well-developed infection in the rabbit in the same unit dose as is required to sterilize the blood, it is obvious that it must possess high therapeutic penetrability or else it could not exert a therapeutic effect in all parts of the body comparable to that displayed in the circulating blood. It is this feature of the action of tryparsamide which more than any other finally led to its use in trypanosomiasis and neurosyphilis. Its spirocheticidal action, however, is distinctly less than its trypanocidal action.

The paper concludes with an analysis of the factors concerned in the action of tryparsamide in trypanosomiasis and syphilis.

The following summary is given :—

" A study of the action of tryparsamide on the animal organism and on experimental infections produced by trypanosomes and spirochaetes showed that, although the drug exhibits no unusual parasiticidal effect, it possesses properties of action which peculiarly adapt it to the treatment of trypanosomiasis and to certain classes of syphilitic infections, especially those that call for the use of drugs with high penetrability as well as those that might be influenced favourably by reinforcement of processes of natural resistance. The use of the drug is advocated on this basis rather than on the basis of high potential parasiticidal action."

W. Y.

FOURNEAU (Ernest), TRÉFOUËL (Jacques), TRÉFOUËL, Mme., & VALLÉE (Jean). **Sur une nouvelle série de médicaments trypanocides.**—*C. R. Acad. Sci.* 1924. Feb. 11. Vol. 178. No. 7. pp. 675–676.

——, ——, ——, & ——. **Recherches de chimiothérapie dans la série du 205 Bayer. Urées des acides aminobenzoylaminonaphtaléniques.**—*Ann Inst. Pasteur.* 1924. Feb. Vol. 38. No. 2. pp. 81 114. [86 refs.]

The first of these papers is practically a summary of the second, which, after reviewing the literature dealing with the drug " Bayer 205," discusses its chemical composition. The authors believe that they have discovered the formula of " Bayer 205," viz., the urate of meta-aminobenzoyl-para-methyl-meta-aminobenzoyl-1-aminonaphthalene-trisulphate of sodium -4-6-8. Owing to the difficulty experienced in obtaining a sufficiency of " Bayer 205," the authors state that they are not absolutely certain. They have prepared a substance which they designate " 309 " and believe to be identical with " Bayer 205."

" Bayer 205 " belongs to a series of substances of great interest from the biological and bacteriological points of view. It opens up new fields, and if it does not fulfil all the hopes aroused from laboratory work, yet it is certain to play an important part in the treatment of trypanosomiasis. It has the grave objection of producing a more or less permanent nephritis, and research must be directed towards eliminating from the compound the substances responsible for this toxic action.

Among the series of urates studied by the authors some compounds act (in the mouse) less efficaciously than " 309," but cost is less and it is possible they may be more active on large animals This is the case with the urate of meta-aminobenzoyl-methyl-aminobenzoyl-acid K (" 309 " in which the acid B is replaced by the acid K). It is intended to test this preparation in Africa.

W. Y.

LANGE (L.) & KERSTEN (H. E.). **Weitere Untersuchungen ueber "Bayer 205."** [Further Observations on " Bayer 205."]—*Cent. f. Bakt.* I. Abt. Orig. 1924. Feb. 15. Vol. 91. No. 5. pp. 323–330. [5 refs.]

The authors point out that there exist in the literature certain discrepancies regarding the toxicity of the drug for mice ; HAENDEL

& Jötten give 18–20 mgm. as the toxic dose, but they add that occasionally as much as 30 mgm. is tolerated, Mayer and Zeiss state that the toxic dose is about 10 mgm., whilst, according to Miessner and Berger, it is between 10 and 15 mgm. The authors themselves re-investigated the subject and came to the conclusion that the toxic dose is about 18–20 mgm. and that even very old solutions (41 months) show only a slight increase in toxicity.

In a series of therapeutic experiments, it was found that old solutions of the drug were as efficacious as freshly made solutions.

As a prophylactic, it was found that a dose of 1 mgm. protected a mouse for 47 days, even when it was inoculated twice, *e.g.*, on the 28th and 47th days. Animals which had been cured by a dose of 1 mgm. on each of two consecutive days showed a certain, but not complete, resistance when re-inoculated 114 and 117 days respectively afterwards. After periods of 143 and 171 days, no increase of resistance, as compared with normal animals, was observed.

Reference is made to the fact that Kleine and Fischer (this *Bulletin*, Vol. 20, p. 317) explained the observation that " Bayer 205 " acts differently in different trypanosome species and in the same species in different hosts on the hypothesis that in naturally infected animals the parasites find their most favourable medium for growth, and that under these conditions they are less sensitive to the action of drugs, and consequently the host is less easily sterilized. Lange and Kersten believe that this explanation is not correct, for they hold that it is in those animals where the parasite quickly swarms in the blood that it finds its most suitable medium and not in hosts where the infection runs an extremely chronic course, producing little, if any, evidence of disease, as in *T. lewisi* of the rat and *T. caprae* of goats; in such conditions the infection can be said to be in a state of biological equilibrium.

Boundless growth and increase of the parasites as must occur in an optimum medium would lead soon to a fatal end, either for the animal or for the man. The authors cannot, therefore, agree with Kleine and Fischer that in the above mentioned cases, the trypanosomes find an optimum medium, but they hold that the contrary is far more likely to be the case. They intend in a further paper to go thoroughly into this matter, which is not without significance, both from the theoretical and practical points of view. A boundlessly increasing, highly virulent parasite, during a heightened extremely active metabolism, seizes upon everything in its vicinity which, so to speak, comes its way, whilst an attenuated strain behaves in a much more inert manner.

The authors find support for this view in the experiments published by Haendel and Jötten to the effect that trypanosomes in the blood of a mouse which had been in only short contact with " Bayer 205 " immediately lose their power of growth, so that when once more introduced into an optimum medium by inoculation into a fresh mouse they are no longer capable of producing infection.

W. Y.

Kleine (F. K.). **The Action of Bayer "205" in Trypanosomiasis.**—*Lancet.* 1924. Feb. 23. pp. 384–385. [1 ref.]

This paper deals with substantially the same matter as previously recorded elsewhere and already noticed here. [This *Bulletin*, Vol. 20, p. 317 and Vol. 21, p. 56.]

W. Y.

DERVISH (J.) & LAIGRET (J.). **Contribution à l'étude des modes de disparition des Trypanosomes des souris sous l'action de divers médicaments actifs ; émétique, 189, 205 Bayer.**—*Bull. Soc. Path. Exot.* 1923. Dec. 12. Vol. 16. No. 10. pp. 770–781. With 13 figs.

This paper is divided into two portions. The first gives the results obtained with " Bayer 205 " in experimental trypanosomiasis of the mouse and the second the result of a detailed study of the morphological alterations observed in the blood of animals treated with " Bayer 205," with tartar emetic, and with 189, respectively. The parasites used were *T. brucei, T. equiperdum, T. evansi, T rhodesiense, T. lanfranchii* and *T. pecaudi.*

The conclusions regarding the first part of the work are that Bayer 205 is a strongly trypanocidal drug. The results confirm those of previous workers.

With regard to the second question, the authors write that the disappearance of trypanosomes is preceded by sundry morphological alterations of which none is, strictly speaking, characteristic of the therapeutic agent injected, but the grouping of these changes is sufficiently characteristic to be summarized as follows :—

With emetic there is a predominance of rounded up forms ; they appear early and their number increases progressively up to the total disappearance of the trypanosomes ; granular changes and degenerative vacuolation are late and but little marked. Phagocytosis of the trypanosomes by leucocytes is not uncommon.

With " Bayer 205 " the dominant change is, on the contrary, granular degeneration. It precedes all the others, and the rounded up forms are rare. Between the fourth and the sixth hours there is abundance of divisional forms and of forms with two nuclei without division of the blepharoplast. The degenerative vacuolation is more marked than with the other drugs.

The drug " 189 " shows an intermediate action approaching rather to that of emetic ; rounded up forms are numerous, granular degeneration is late and never so generalized as with " Bayer 205." There is nothing peculiar in the mode of division of the trypanosomes.

MESNIL adds a note concerning the action of " Bayer 205 " on *T. gambiense* isolated in January, 1920, from a patient and preserved in guineapigs. Details are given concerning 8 guineapigs inoculated with the trypanosomes in October 1922 ; 6 were treated at different periods of the infection and 2 were kept as controls. Of the 3 animals treated sufficiently early, 2 were cleared of trypanosomes by a double injection of the drug. The third, which appeared to have tolerated the injection, suddenly died, without doubt from a secondary infection. The other 3 animals treated later did not appear to tolerate the dose injected. Three dogs were also inoculated in October 1920 ; two were sterilized by a single injection of the drug and the third was kept as a control.

MESNIL also summarized a few observations made by BLANCHARD and LEFROU at Brazzaville on the treatment of infected natives. Three patients in the first stage of the disease were treated in September 1922 : the first had 4 injections (3 gms. in all) and the other two a single injection, one of 1 gm. and the other of ·5 gm. ; there is no relapse to date. Two patients in the second stage of the disease with changed spinal fluid were also treated. The first received 4 injections (3 gms. in all) in September 1922, and remained free from parasites until

March 1923, when he disappeared. The second had a single injection of 1 gm. in October 1922, and relapsed in December of the same year.

W. Y.

SHINTAKE (Tami). **Ueber die Beeinflussung der Vermehrung der Trypanosomen durch "Bayer 205."** [The Influence of "Bayer 205" on the Multiplication of Trypanosomes.] -- *Arch. f. Schiffs- u. Trop.-Hyg.* 1923. Vol. 27. No. 12. pp. 433-444.

Reference is made to the previous work of MAYER and ZEISS and of HESSELBACH on this subject [this *Bulletin*, Vol 17, p. 334, and Vol. 20, p. 325]. The author has re-investigated the question and has arrived at the following conclusions:—

> After treatment of infected mice and rats with "Bayer 205," and more especially with the smallest active doses, there is a marked stimulation of division which is indicated by the increase of divisional forms seen in the blood of the treated animals as compared with those found in the blood of heavily infected untreated animals.
>
> This process appears to occur chiefly in the acute infections of small animals.
>
> The division forms disintegrate before the single forms.
>
> In treatment with inactive doses—especially in relapses—this reaction of division stimulation did not appear to take place in the author's experiment.
>
> It remains to be seen whether, in chronic natural infections, with periodic swarming of the trypanosomes, there exists a greater activity of the drug during these periods—in contradistinction to the afebrile periods with few trypanosomes in the blood—which would be dependent on the greater sensitiveness of the division forms.

W. Y.

LEVADITI (C.) & NICOLAU (S.). **Mode d'action du bismuth dans les trypanosomiases et les spirilloses.**—*C. R. Acad. Sci.* 1923. Apr. 23. Vol. 176. No. 17. pp. 1189-1192. [5 refs.]

Reference is made to previous work of Levaditi and YAMANOUCHI, which showed that atoxyl, although incapable of destroying trypanosomes *in vitro*, becomes strongly trypanocidal after contact at 37° C. with fresh extract of liver. The drug becomes transformed into trypanotoxyl, which does not act on strains of trypanosomes resistant to arsenic. These experiments indicate that certain drugs employed in the treatment of trypanosomiasis and spirillosis exercise their parasiticidal action after being subjected to more or less profound modifications in the organism. In the present paper, the authors have enquired whether bismuth behaves in the same manner. They found that a 2 per cent. solution of tartrobismuthate of sodium and potassium, which itself is inactive *in vitro*, becomes strongly parasiticidal when previously allowed to stand in contact with extract of liver, and, to a less degree, with that of other organs. They call this active body bismoxyl. The substance in the liver which activates the drug is resistant to heat. Bismoxyl differs from trypanotoxyl in that *in vitro* it destroys not only trypanosomes but spirochaetes; this difference throws light on the superiority of bismuth over arsenic in the treatment of spirochaetosis. Other salts of bismuth were treated in the same way, giving rise to bismoxyl. Experiments showed that the quantity of bismoxyl formed depends on the quantity of organ extract and not on the concentration of the bismuth salt. If a mixture of fresh extract of liver and a soluble bismuth salt (in the most favourable proportions) is preserved for 4 hours at 37° C., it is noticed that the mixture becomes progressively bleached and turbid. It was found that it was this precipitate of proteid substance which possessed the parasiticidal power. Apparently, proteid material of the extracts enters into the constitution of the active bismuth derivative to form a toxalbuminous bismuthate analogous to the toxalbuminous arsenical derived from atoxyl. In the presence of spirochaetes or of trypanosomes this toxalbumin is, without doubt, absorbed by the parasites and kills them. The spirochaeticidal properties of the toxalbuminous bismuthate (bismoxyl) become attenuated when heated towards 90° C. and disappear after heating at 100° C. for 10 minutes. Bismoxyl in contradistinction to trypanotoxyl has a curative action in human and experimental syphilis.

W. Y.

PONSELLE (A.). **Essai d'immunisation contre les trypanosomes pathogènes.**—*Ann. Parasit. Humaine et Comparée.* Paris. 1923. June. Vol. 1. No. 2. pp. 159–166. With 2 figs. [15 refs.]

The author summarizes the various attempts made to prepare vaccines for the treatment or prophylaxis of trypanosomiasis and points out that practically all efforts were of no avail and that the few good results claimed have not been confirmed.

The author's attempts at the production of a vaccine consisted in adding to the blood of a nagana mouse, in the last stage of the infection, a solution consisting of a mixture of monobasic and dibasic phosphates in such a proportion as to result in a definite concentration of hydrogen ions. He used for the preparation of this solution very pure phosphates prepared according to the method of SÖRENSEN for the colorimetric estimation of the concentration of the hydrogen ions and made up his solution according to the following formula:—

Monopotassium phosphate (PO^4KH^2)	1·80 gm.
Disodium phosphate ($PO^4Na^2H2H^2O$)	0·20 gm.
Water (doubly distilled)	100·00 cc.

This solution is distributed in a series of tubes, 2·5 cc. in each and sterilized at 115° C. for 20 minutes. A nagana mouse in the last stage of infection is killed by strangulation and its blood aspirated from the heart under aseptic precautions; generally about ·5 cc. is obtained and added immediately to one of the tubes containing 2·5 cc. of the phosphate solution and allowed to stand at 20° C. for 20–24 hours. The contents of the tubes are then agitated and the vaccine is ready for use.

Intraperitoneal injection of 0·1 cc. of this vaccine into a mouse produced no reaction; 4 or 5 days later the animal's blood agglutinated nagana blood, giving rise to the formation of beautiful rosettes and often paralysis of the trypanosomes. When mice treated in this manner were inoculated 8 to 10 days later with 0·05 cc. of a suspension of nagana blood containing 4 trypanosomes to a 1/12th inch objective microscope field many (70 per cent. of young animals) proved resistant, whilst the controls died in 5 to 6 days after inoculation.

W. Y.

Bassett-Smith (Percy). **Naval Medical History of the War. Section of Tropical and Sub-tropical Medicine. Part II. (i) Trypanosomiasis ; (ii) Kala Azar.**——*Jl. Roy. Nav. Med. Serv.* 1923. July. Vol. 9. No. 3. pp. 197–203. With 3 charts.

Chagas (Carlos). [In Portuguese and English.] **Descoberta do** *Tripanozoma Cruzi* **e verificação da Tripanozomiase Americana. Retrospecto Historico. The Discovery of** *Trypanosoma Cruzi* **and of American Trypanosomiasis. Historic Retrospect.**—*Mem. Inst. Oswaldo Cruz.* 1922. Vol. 15. No. 1. pp. 67–76 [Portuguese] ; 3–11 [English].

Morgenroth (J.) & Freund (R.). **Ueber die Wirkungsweise von "Bayer 205" bei der experimentellen Trypanosomeninfektion der Maus.** [On the Mode of Action of "Bayer 205" in Experimental Trypanosomiasis of the Mouse.]—*Klin. Woch.* 1924. Jan. 8. Vol. 3. No. 2. pp. 53–55. [7 refs.]

BLACKWATER FEVER.

THOMSON (J. G.). **Preliminary Report on the Results of Investigations into the Causation of Blackwater Fever in Southern Rhodesia. Presented to the Legislative Council, 1923.**—7 pp. With 2 Charts. 1923. Salisbury, Rhodesia: Govt. Printer.

The following are the conclusions :—

"1. The type of malaria which predominates in Southern Rhodesia is the pernicious type (synonyms—bilious remittent fever, malignant tertian, aestivo-autumnal, or sub-tertian fever). This forms 96 per cent. of the cases and the parasite is *Plasmodium falciparum*.

"2. The sexual forms of this parasite are comparatively rare amongst adult natives and adult Europeans, but are extremely common amongst native children and also in young European children.

"3. The curves of malaria and blackwater fever represented graphically show a definite co-relationship over a period of ten years. This is so definite that the evidence of the diseases being the same seems conclusive, especially when taken in conjunction with the microscopic findings.

"4. In Southern Rhodesia during the years 1922 and 1923 all blackwater fever cases examined before the actual onset showed parasites in the peripheral blood. As the parasites as a rule disappear from the peripheral blood with the onset of blackwater, many cases showed no parasites, but all *post-mortem* examinations obtained in such cases showed definite evidence of malaria.

"5. In over 150 cases of blackwater fever a history of repeated attacks of malaria was obtained.

"6. In all cases of blackwater examined a history was obtained of inefficient and irregular quinine treatment.

"7. Blackwater fever is common amongst the poorer classes, and occurs in those who take no precautions or are careless as regards precautions against the attacks of mosquitoes in malarious districts. This is one of the most obvious factors which I have been able to elucidate from personal visits to the houses in which blackwater fever patients had resided. It is specially associated with those occupations which expose to infection—for example, transport drivers and prospectors.

"8. The disease ought not to be so common amongst farmers, women and children who are living in fixed homesteads, and its occurrence amongst these is due to bad housing, the improper use or failure to use mosquito nets, as well as to lack of attention to the breeding of mosquitoes in the immediate neighbourhood of their houses.

"9. The commonest anopheline is *Anopheles costalis*, which seems to avoid large towns which are well sanitated, but this mosquito occurs in very large numbers in the rural districts of the whole of Southern Rhodesia.

"10. In conclusion, there is no doubt from these researches in this country that the prevention of malaria by every known method will reduce blackwater fever to a minimum. The Government of this country, after careful consideration of all the factors placed before them, may devise certain methods for the amelioration of this condition."

W. Yorke.

BLANCHARD (M.) & LEFROU (G.). **Spirochètes dans la fièvre bilieuse hémoglobinurique et pseudo-spirochètes du sang.**—*Bull. Soc. Path. Exot.* 1923. Dec. 12. Vol. 16. No. 10. pp. 726–729. [9 refs.]

This paper is a rejoinder to that of THOMSON [this *Bulletin*, Vol. 21, p. 64]. The authors state that the question of pseudo-spirochaetes is not new, and that it is not surprising that in the deposit of the third centrifugation pseudo-spirochaetes are found. They themselves have seen in the blood of blackwater cases and in that of healthy individuals more or less thick elongated filaments simulating spirochaetes, especially C or S shaped forms, but these are never found in the numbers of which THOMSON writes. The bodies found by the authors in blackwater fever [this *Bulletin*, Vol. 20, p. 353] had nothing to do with pseudo-spirochaetes; in addition to the C and S shaped forms, typical forms with three or four very regular undulations of equal amplitude, sharply coloured, and identical in all respects with the icterohaemorrhagic spirochaetes, and in particular exactly similar to the spirochaetes found in the natives suffering from infectious jaundice. These spirochaetes are never found in normal persons. On the other hand, they are not found in all haemoglobinurics. Up to date 10 cases have been examined and spirochaetes found in only four. The authors do not consider that these elements, which are so clearly delimited, can be artifacts, because the technique was always the same, and they cannot conceive why they should appear with such inconstancy and in such quantity in certain cases.

W. Y.

KRITCHEWSKY (I. L.) & MURATOFFA (A. P.). **[On the Pathogenesis of Haemoglobinuria in Malaria.]**—*Vratchebnoye Obozreniye (Medical Review)*. Berlin. 1922. May 15. Vol. 2. No. 5. pp. 203–206. [In Russian.]

—— & ——. **Zur Hämoglobinurie-Pathogenese bei Malaria.**—*Ztschr. f. Immunitätsf. u. Experim. Therap.* I. Teil. Orig. 1923. Oct. 10. Vol. 38. No. 1/2. pp. 38–56. [8 refs.]

The following summary is given:—

1. Haemoglobinuria in malaria is in great part evoked through the combined action of quinine and the lipoid substances of the organism.
2. When added to human serum quinine acts haemolytically *in vitro* on human erythrocytes. Just as in the case of snake venom, quinine is activated by heated as well as by unheated serum. The substance which activates quinine is not destroyed at 56° C. or 62° C.
3. Besides substances which aid in haemolysis human serum also contains those which inhibit it.
4. To the activating substances lecithin undoubtedly belongs; this substance even in quite minimal doses induces the quinine haemolysis *in vitro*.
5. In experiments *in vitro* individual variations in the erythrocytes appear quite sharply, the red cells being susceptible to haemolysis in different degrees.
6. Cholesterin, which inhibits the haemolytic action of snake venom +lecithin, exerts no noticeable inhibition of the haemolysis due to quinine +lecithin.
7. Quinine + lecithin becomes fixed to the red stroma.
8. Substances which activate quinine haemolysis and those which inhibit it are found not only in the blood serum, but also in cells.
9. The individual appearance of haemolysis in malaria is connected on the one hand with the individual peculiarities of the erythrocytes, and on the other hand with peculiarities of the serum, that is with the different lipoid content of the red cell stroma and blood serum.
10. In certain individuals suffering from malaria, or various other diseases, an increased lipoid content is to be expected, and this gives rise to haemolysis on quinine administration.

Climate and other conditions may well exert an influence on lipoid metabolism.

11. Quinine haemolysis is a physico-chemical phenomenon which expresses itself in modification of the degree of dispersion of the colloids of the erythrocyte protoplasm. Quinine calls forth *in vitro* the changes of the dispersion degree of the protoplasma colloids.

12. The toxic action of quinine is of itself insignificant; it appears only when the content of the quinine activating lipoid substances is raised.

13. The toxic action of all poisons is related to a disturbance of the normal dispersion degree of the protoplasma colloids.

14. It is to be presumed that the poisons which exhibit no incubation period are able to exert their effect without any activating substances. In cases of poisons with incubation period, the time is probably occupied by the accumulation of the activating substances.

W. Y.

HAMET. **Un cas de fièvre bilieuse hémoglobinurique à répétition**—*Arch. Méd. et Pharm. Nav.* 1923. Nov.–Dec. Vol. 113. No. 6. pp. 505–511.

Details are given of a case of chronic malaria contracted in Senegal, the subject of which suffered from repeated (thirteen) attacks of blackwater fever during the year following his return to France. A shorter account is also given of a second case in which the attacks of blackwater fever took place six months after repatriation.

W. Y.

PARROT (L.). **Accès mortel de fièvre bilieuse hémoglobinurique chez un indigène algérien**—*Arch. Inst. Pasteur d'Algérie.* 1923. Dec. Vol. 1. No. 4. pp. 607–608.

RAND (R. F.) **Prophylaxis of Malaria and Blackwater Fever.** [Correspondence.]—*Brit. Med. Jl.* 1924. Jan. 12. pp. 85–86.

SPENCER (H. A.). **Blackwater or Haemoglobinuric Fever; a Case occurring upon the Middelvelt.**—*S. African Med. Rec.* 1924. Jan. 26. Vol. 22. No. 2. pp. 28–32. With 1 chart.

MISCELLANEOUS.

MACFARLANE (N. M.). **Some Observations on 28 Years' Medical Practice in an African Native Territory.**—*S. African Med. Rec*, 1923. Nov. 10. Vol. 21. No. 21. pp. 492–496.

This is a story of Basutoland, a country rather more than half the size of Ireland, and having a native population of about 200,000. Once upon a time it was under the Cape ; then there were only 2 medical officers in the country. In 1884 it came directly under the Imperial Government, and in 1893, when the author first went there, the profession was represented by 5 medical officers and two dispensaries. In 1921 there were 12 medical officers, 4 well-equipped and well-staffed hospitals having accommodation for 125 in-patients, a cottage hospital of 8 beds, and a Leper settlement with a European staff, a capacity for 750 inmates, and actually providing for 500. In that year the number of out-patients treated at hospitals and dispensaries was 39,147 ; of hospital in-patients 2,288 ; of major operations 516 ; and of minor operations 1,752.

The author tells us that although the Basutos are a hardy lot of hill men, they have a lot of sickness ; and that although at first they were extremely reluctant to embrace the benefactions offered by British surgery, they are now eager for treatment. They bear operations well, and are good patients -obedient and entirely tractable. The prevalent diseases are syphilis, gonorrhoea, and gastro-intestinal disorders, the first two being placed by the natives to the account of the white man. Syphilis, though quite as common, is not now so terribly destructive as it was 28 years ago ; though (from the prevalence of gonorrhoea) it cannot be assumed that the Basutos are distinguished for continence, yet from the fact that in the course of 28 years and observations of thousands of cases he has encountered only two primary syphilitic lesions of the genitalia, the author is of opinion that this disease is spread chiefly by cooking and drinking vessels and by clothing and bedding. As sequelae of gonorrhoea tubal and ovarian disease is common, and sterility— a dreadful reproach in Basutoland—is becoming frequent. Gastro-intestinal disorders seem to be attributable to a monotonous diet of mealie-meal and millet, and occasional gorgings of meat ; but vegetables of various kinds are now being cultivated. Appendicitis occurs, but may perhaps be explained by surgical opportunity. Respiratory diseases are not common, but pneumonia is a fatal disease. Smallpox was very much prevalent formerly, but has been practically suppressed by vaccination, to which the Basutos were easily and completely reconciled. Measles, scarlatina, mumps and whooping-cough occur, and of late typhus has appeared, though the cases have been of a mild nature.

A. Alcock.

BRUMPT (E.) & JOYEUX (Ch.). **L'assistance médicale indigène aux travailleurs noirs africains.**—*Presse Méd.* 1923. Dec. 15. Vol. 31. No. 100. (Supplement.) pp. 2093–2100. With 5 text figs. [3 refs.]

This article deals with the medical and hygienic organization of the Transvaal Mines, recently visited by the authors. The Transvaal obtains 40 per cent. of its labour from the neighbouring Portuguese Colony of Mozambique, its agent being the Witwatersrand Native

Labour Association. Nearly 50,000 natives were engaged in the year 1922. The recruits are collected at the railway station on the Portuguese frontier, where suitable buildings have been erected, and are carefully examined by a Portuguese doctor and a medical representative from the mines. Those who are engaged are taken to Johannesburg, some 20 hours' journey, where they are maintained for a month without working, become acclimatized, and receive three injections of antipneumococcic vaccine. Arrived at the mines they occupy in the compounds rooms with cemented floors, containing charcoal stoves, in which 24 to 36 persons are provided each with a bunk of reinforced concrete. Cooked food is provided, a concession which seems to have specially struck the authors. Furthermore, they are looked after by a Portuguese official or " Curator," whose duty it is to visit each mine monthly and receive and adjudicate on complaints, and report is made annually to the Governor of Mozambique.

In 1910, 11 and 12 the mortality was 97, 87 and 70 per mille, figures which do not include the deaths before commencement of work. Since 1913 recruiting has ceased north of 22° S. and measures have been taken against preventable disease. The mortality in 1913 was 26·5, in 1919 18·6, in 1922 14·2, the numbers varying in this period between 50 and 80 thousand. In 1914 the chief causes of death were in the following order :—lobar pneumonia, tuberculosis, silicosis, meningitis. Pneumonia is prevented by immunization and general measures of hygiene. Its mortality, 12·8 in 1906, had fallen to 2·6 per mille in 1919. Of cerebrospinal meningitis cases 35 per cent. are due to the pneumococcus, the remainder to the meningococcus. Silicosis is prevented by ventilation and spraying. In 1912 26 per cent. of labourers were attacked, in 1916 6·5. Natives who have acquired silicosis or tuberculosis are invalided and indemnified. In 1922, 819 were so treated, at a cost of £43,768. Malaria is rarely seen ; deaths from this cause in 1914–15 did not reach 1 per 6,000.

Invalided natives are taken to the Portuguese frontier station, hospitalized, if necessary, and then shepherded by the W.N.L.A. to their villages. At the termination of the contract, generally after a year, the labourers are repatriated : 55 per cent. sign on for a second period, but the authors note that in Mozambique work is compulsory.

The authors proceed to compare the conditions of labour in the French colonies. In Madagascar the native breaks his contract if he wishes ; there is no obligation to work. In French Congo little has been done to protect the workers and supply them with medical aid. In August 1923 there were 20 doctors for this great area with a population of 2,450,000, whereas in Angola, a smaller country, there were 71. Belgian Congo counts 94 state doctors and 24 medical missionaries. In Cameroon, however, the conditions are better than in Congo française. At Brazzaville women were recently seen acting as porters ; depopulation therefore is not surprising.

The authors lay down rules which should be imposed on all large employers of labour, rules such as are in force in other colonies. They note that whereas neighbouring colonies publish annual medical reports, reports, statistics, etc. from French Colonies are often not accessible to the public. Such economies account in part for the lack of personnel, but they note, also, that the salaries offered are " derisory." France, they believe, is the only country which, in engaging doctors for the colonies, does not insist on their taking a course at a school of tropical medicine. They remark, finally, that the budget of a colony may appear to balance, but only by the omission on the expenditure side of the human capital that has disappeared, which to the home country represents a deficit that cannot be met.

A. G. B.

VAN DEN BRANDEN (F.) & VAN HOOF (L.). **Fonctionnement du Laboratoire de Léopoldville pendant l'année 1922.**—*Ann. Soc. Belge de Méd. Trop.* Brussels. 1923. Nov. Vol. 3. No. 2. pp. 157–180. With 6 figs. and 1 graph.

This is a report of a year's diligent work, including besides a comprehensive laboratory routine, original epidemiological and therapeutic investigations. Some items of general interest may be extracted.

Among 48 children suffering from subtertian ague crescents were found in one case only. Though, of course, the mortality from amoebiasis has decreased greatly since the institution of emetine treatment, yet recently it has again increased. There has been considerable dubiety regarding the nature of an epidemic varioloid that since 1918 has been classed as alastrim : in 1922 the number of recorded cases was 625 with a mortality of practically 10 per cent., and the conclusion now is that it should be dealt with as if it were smallpox. Various therapeutic trials of bismuth salts are recorded : trepol seems to have no trypanocidal action, but, applied as powder, is very effective for phagaedenic ulceration associated with the spiro-fusiform bacillus ; in oily suspension, though painful and readily toxic, it is pronounced to be comparable with the higher arsenical salts in the treatment of yaws, but Bi 36, Bi 33.8, and Bi 36 Meurice are considered more amenable and more effective (comparatively to their Bi content) in the treatment of this disease ; muthanol (hydroxide of bismuth in oily suspension), though not so painful or so toxic, is not so efficacious as trepol in yaws. Therapeutic trials of arsenical products are also recorded : Bayer 205, in 64 human cases, was found efficacious in the early stages, but not better than atoxyl in the late stages of trypanosomiasis : cacodylin, though well borne in large doses, had no trypanocidal effect in two cases. In animal trypanosomiasis Bayer 205 seemed to have no effect on *T. cazalboui*, but a marked effect upon *T. congolense*. Annexed to the laboratory there is a small medical school for training native hospital and laboratory assistants, but the technical instruction appears to be frustrated or obstructed by the imperfect literary education of the candidates.

A. A.

WALRAVENS (P.). **Compte-rendu du Congrès de médecine tropicale en Afrique occidentale (Saint Paul de Loanda).**—*Ann. Soc. Belge de Méd. Trop.* Brussels. 1923. Nov. Vol. 3. No. 2. pp. 181–207.

The first West African Congress of Tropical Medicine, held at St. Paul de Loanda from the 16th to the 23rd July 1923, was attended by delegates from the Belgian colonies, from France and the French colonies, from Portugal and her colonies, and by a delegate from British West Africa (Nigeria) and one from the Union of South Africa. The programme for discussion was extraordinary full and varied—well worthy of an historic event. It included not only all the classical topics of tropical medicine and sanitation and the large problems of sleeping sickness, but also various social-sanitary matters, such as tuberculosis, venereal prophylaxis, infant hygiene, etc., the bearing of which upon the destinies of tropical populations is just beginning to be recognized.

A. A.

SMITH (Lawrence W.). **Medical Impressions of the Philippine Islands.**—*Boston Med. & Surg. Jl.* 1923. Dec. 20. Vol. 189. No. 25. pp. 1018–1026. With 4 figs.

The author made a five-weeks' tour round the principal islands while serving as Medical Officer in the Philippine Health Service during a leper collecting trip and afterwards worked for a year in the Department of Pathology and Bacteriology in the College of Medicine at Manila, where there is a large hospital and about 1,000 autopsies are made yearly.

He says that there are 5,000 lepers at the Culion Colony and 5,000 at large in the islands, but they are brought in now more willingly than in the past. He gives some description of yaws, hookworm infection, malaria, dysentery and enteric,with special reference to their prevention. Cholera, smallpox and plague have almost disappeared, But the real menace to health is to be found not among the " tropical diseases," but in tuberculosis. From autopsy statistics he concludes that over 35 per cent. of the total deaths [? at Manila] are due to tuberculosis, which he believes to be " practically entirely of the human type," for very little milk is drunk. The chief forms are pulmonary, renal and intestinal.

Other diseases mentioned have a restricted distribution. Such are filariasis in a focus of 30 square miles ; *Schistosoma japonicum* infection on the island of Leyte, where the intermediate host has not yet been found ; lithiasis, especially of the kidney and bladder, in a mountainous region in Mindanao near Lake Lanao and also in a locality 25 miles from Manila. Scarlet fever is practically unknown ; and whooping cough and anterior polyomyelitis are mild. Rickets was not seen, though " it is safe to say that every child is on a fat deficient diet," but " the people live out of doors the year round." Scurvy is practically unknown, but beriberi is a great cause of child mortality. The author met with but one case of pernicious anaemia, in an American, and believes leukaemia to be rare. He was struck by the " very low incidence of syphilis," but by this he appears to mean post mortem lesions, for he goes on to say that he found only one aortic aneurism and two cases of syphilitic aortitis. In routine Wassermanns on hospital admissions less than 0·5 per cent. were positive, and many of these could be explained by a yaws infection. Gonorrhoea was common enough. Sprue and dengue receive mention. The incidence of acute nephritis also was low, and vascular nephritis is seen less often than at Boston. Of primary liver carcinoma he saw 12 cases, confirmed by autopsy, in less than a year, and many more clinically ; most occurred in the decade, 35–45. He notes a very high incidence of chronic hepatitis or cirrhosis.

A. G. B.

BRITISH GUIANA. **Report of the Government Bacteriologist, British Guiana, to the Tropical Diseases Research Committee, 1922.** [ROSE (F. G.), Government Bacteriologist.]—[MS. received from the Colonial Office.]

An attempt was made by the injection of barium sulphate under the skin of a patient with an elephantoid condition of one leg to determine the presence and site of lymphatic obstruction, the progress of the barium being studied by means of serial radiograms. Up to the present barium has not been detected in the neighbouring lymphatic glands.

Experiments have been made on the effects of high frequency currents on filarial embryos. Treatment was followed by a fall in the number of embryos, but no effects were noted in the embryos.

To the arm of a filarial patient who had been under observation for some years a pad soaked in 1 per cent. solution of antimony potassium tartrate was applied on three occasions; live adult filariae were believed to be present in a thickened lymphatic beneath. After the third application the patient became very ill with symptoms of severe toxaemia. It is not proposed to repeat the experiment.

Examination of six captured rats and the injection of their tissues into guineapigs did not reveal the presence of *S. icterohaemorrhagiae.*

It is stated that the results of prophylactic inoculation with streptococcal vaccines in filarial lymphangitis have proved so encouraging that increasing numbers of people have recourse to this method of treatment. A large number have remained under observation for 12 months or more. Of the 159 in this series 57, or 35·8 per cent., showed microfilariae in the peripheral night-blood and all presented typical signs of filarial lymphangitis and lymphadenitis. A number of tables illustrate points of interest. Of the 159, 111, or 69·8 per cent., had no recurrence for at least 12 months after inoculation, and only 26, or 16·4 per cent., had any further attacks before an interval of 6 months had elapsed.

	No. inoculated.	No. with recurrences (if any) more than 12 months after.		No. with recurrences before 6 months' interval.	
			Percentage.		*Percentage.*
First attacks ..	37	32	86·5%	2	5·4%
1 attack in 12 months	18	15	83·3%	1	5·6%
1 attack in 6 months	34	21	61·8%	9	26·5%
1 attack in 3 months	41	28	68·8%	5	12·2%
1 attack per month	18	8	44·4%	6	33·3%
1 attack every week or so.	11	7	63·6%	3	27·3%
	159	111	69·8%	26	16·4%

It is clear then, the author writes, that this method of treatment holds out considerable hope of alleviation to those who suffer from this frequent and distressing concomitant of infection with *Filaria bancrofti.*

Of 301 dysenteric stools examined 108 are described as blood and mucus stools and 193 as diarrhoea and mucus and diarrhoea. Of the former group 8 were positive for B. Flexner and 28 for *E. histolytica.* Of the latter group one was positive for B. Flexner. It is concluded that at Georgetown amoebic infection predominates, and that the prevailing dysentery bacillus is B. Flexner.

A. G. B.

DE ALMEIDA (A. Ozorio). **Le métabolisme minimum et le métabolisme basal de l'homme tropical de race blanche. Contribution à l'étude de l'acclimatation et de la loi des surfaces de Rubner-Richet.**—*Jl. de Physiol. et de Path. Gén.* 1919–20. Vol. 18. pp. 713-730. [38 refs.]

——. **L'émission de chaleur. Le métabolisme basal et le métabolisme minimum de l'homme noir tropical.**—*Ibid.* pp. 958 964. [9 refs.]

EIJKMAN (C.). **Le métabolisme de l'homme tropical.**—*Ibid.* 1921. Vol. 19. pp. 33–35. [2 refs.]

These three papers deal with a subject of great practical importance, and on which comment has already appeared in these pages. Professor de Almeida is well known as an investigator on many subjects of physiological importance, and from his researches on white people in Brazil concludes that their basal and minimal metabolism is on the average 24 per cent. lower than in inhabitants of temperate zones. Their habitual intensity of heat production is a factor additional to the law (Rubner-Richet) of surface area, and its lowering is regarded as an adaptation to their environment, and an advantage in their struggle against high air temperatures. The same is true for the coloured inhabitants of these regions (second paper).

The third paper of the series is by Professor Eijkman, of Utrecht, who is well known by his researches in the Dutch Indies, and who has undertaken similar investigations on metabolism there, but has obtained diametrically opposite results with both European and native subjects; in these he found the basal metabolism identical with that in temperate climates. He attempts no explanation of the differences between de Almeida and himself. It is not the province of a reviewer to play such a part. The number of experiments performed by each is so great that individual difference or idiosyncrasies of the subjects may be ruled out. There is evidently a difference of methods or reasoning, but these are not on the surface. It is difficult, however, to believe that such a fundamental fact as basal metabolism is should be greatly affected by climate, any more than body temperature is; on the other hand, it is open to argument that the maintenance of one's temperature must call for less effort on the part of the organism in a warm than in a cold climate. Mere external temperature is, after all, only one feature of a tropical climate, and it is quite possible that other factors might explain why there should be different results in Rio de Janeiro and Java. Many years ago when commenting on an allied matter I wrote: " In dry hot climates physical fitness is promoted by the taking of a considerable amount of out-of-door exercise. Quite otherwise is it in climates like that of the coast line of British East Africa, where the tropical sun is combined with the moisture laden wind. There the possibilities of heat loss by radiation and by evaporation are small, and the English official perforce reduces his heat production to a minimum. He lives indoors, takes as little exercise as possible, and the pallor of his countenance contrasts strongly with the high colour which his colleague in India or Egypt exhibits."

It is quite evident we have not got to the bottom of the matter, and further work lies before the scientific investigator of metabolism in the tropics.

W. D. Halliburton.

FEJGIN (Bronislaya). **Examen de quelques microbes isolés des matières fécales.**—*C. R. Soc. Biol.* 1923. Dec. 22. Vol. 89. No. 37. pp. 1383–1385.

As matter of bacteriological diagnosis and of biological interest attention is here drawn to three microbes, identical in their morphological and cultural and fermentative characters, discovered by the author in stools from suspected dysentery cases. They are small rods of 1 to 4 μ, gram-negative, non-flagellate and non-motile, non-capsulate, non-sporific and non-gelatine-liquefactive. The author describes in detail all their chemical and bio-chemical reactions and concludes that although their fermentative properties are almost identical with those of *B. coli*, yet all their serological properties point to an origin from Shiga and Flexner bacilli modified by a lytic agent formed in the infected animal organism.

A. A.

CLUVER (Eustace H.). **Ventilation: the Problem of Removing Excess Body Heat.**—*Med. Jl. S. Africa.* 1923. July. Vol. 18. No. 12. pp. 291–296. [18 refs.]

Of the two arguments for ventilation, namely (*a*) the removal of CO_2 and deleterious emanations from the human body, and (*b*) assisting dissipation of body heat, the latter is much the more important; indeed, it is very doubtful if the former have any weight at all—though, of course, noxious gases and dusts produced by certain occupations is a matter apart. In health the rectal temperature may vary between 97° F. in the early morning and 99·9° F. in the evening, or even to 101·4° F. after vigorous exercise; on the other hand, little if any lowering of internal body-temperature is caused by cooling the surface of the body for a short time. Thus the dissipation of body-heat in warm climates is an important problem. The kata thermometer devised by Leonard HILL is used in the Rand for determining the cooling power of the atmosphere. In general it may be said that hard work is done in the Rand mines under conditions that do not exceed dry-kata 4 and wet-kata 15. But though a cool climate is invigorating, fatigue is caused by exposure to low atmospheric cooling powers. Johannesburg by-laws require for places of public assembly dry-kata reading 5 and wet-kata reading 18. "With a sufficiency of windows and fans it is probable that buildings of all kinds in the Transvaal can be satisfactorily ventilated at all seasons." The contents of the paper hardly fulfil the promise of the title.

A. A.

STEPPUHN (Oscar), ZEISS (Heinz) & BRYCHONENKO (Sergei). **Biochemische Untersuchungen ueber "Bayer 205" (Vorläufige Mitteilung).** [Biochemical Investigations of "Bayer 205".]—*Arch. f. Schiffs- u. Trop.-Hyg.* 1923. July. Vol. 27. No. 6. pp. 206–210. [3 refs.]

MAYER and ZEISS ascertained that the serum of animals treated with "Bayer 205" acted curatively for a month or more on animals infected with trypanosomes (see this *Bulletin*, Vol. 19, p. 508). The authors therefore enquired whether the drug itself could be found in the circulation or the serum had acquired curative properties as a result of the treatment. They made use of a colour reaction which will detect as little as 0·0001 gm. "Bayer 205," and depends on the cleavage of the drug in alkaline solution with union of the components with diazotized sulphanilic acid in acid solution. They discovered, moreover, that if the blood of a rabbit treated with a big dose of "205" is removed soon after it will not clot. This property is retained for some hours with a dose of 0·3 gm. per kilo; and even a very small dose reduces the amount of clot formed. With the failure to clot goes a sharp fall of temperature; with its recovery the coagulability returns. The loss of coagulability is due to the albumin components (fibrinogen, thrombin) being robbed of their properties by combination or adsorption. It was found also that undiluted serum in which the drug is dissolved will not clot even though the mixture be boiled for a long time. Other instances show the property of "Bayer 205" of drawing to itself or protecting all albumins in solution: *e.g.*, if the drug is allowed to stand with the complement, a negative Wassermann becomes positive; rennet cannot clot milk to which "Bayer 205" has been added.

The authors point out various applications in physiology and bacteriology to which these remarkable properties of "Bayer 205" may be put.

A. G. B.

BRAAFLADT (Louis Henry). **The Effect of Kaolin on the Intestinal Flora in Normal and Pathologic Conditions.**—*Jl. Infect. Dis.* 1923. Nov. Vol. 33. No. 5. pp. 434–456. With 1 plate. [46 refs.]

Kaolin is a natural hydrous aluminium silicate, which after purification contains about 47 per cent. of silica, 40 per cent. of alumina and 13 of water. The author used Merck & Company's preparation. Experiments were made on rats, rabbits, guineapigs, dogs and four healthy men. As to the effect on bacteria growing in artificial fluid media it was found that if these are incubated at body temperature and kept in motion for 2–3 hours a large number of bacteria are carried down by the kaolin. Bacterial toxins and toxic products (typhoid and dysentery) were neutralized when treated with kaolin; the mixture was centrifuged, and the supernatant fluid injected into rabbits; the animals survived. The effect on the normal intestinal flora was tested on rats and dogs; a predominantly proteolytic flora was changed to an aciduric. The four men took 30 gm. a day for a month; in three the flora became predominantly aciduric in 8 to 10 days. Digestion was not upset. The type of colony seen under these conditions is described and figured. The clinical observations mainly concern cholera, many cases of which were treated by the author in China (see this *Bulletin*, Vol. 16, p. 434). Fifteen severely ill patients and 20 moderately ill received no other treatment but kaolin, 3 ozs. of a thick suspension at first every half hour; only one died, whereas 9 out of 41 died when treated with salt solution. Notes are given of its use in dysentery, chronic ulcerative colitis and tuberculous enteritis.

A. G. B.

GORDON (R. M.). **The Frequency of Indicanuria.**—*Ann. Trop. Med. & Parasit.* 1923. Dec. 21. Vol. 17. No. 4. pp. 549–551. [12 refs.]

The author tested the urine of 380 cases for indican (by addition of 5 per cent. potassium chlorate, strong hydrochloric acid and chloroform). Of ninety healthy persons, 24 per cent. were positive, but it is noted that many people give opposite results at different times. Of 290 cases undergoing treatment for various disorders 94 per cent. of 35 amoebic dysentery cases were positive, 50 per cent. of 20 malaria cases, and 3 out of 4 cases of sprue. Five bacillary cases were negative. An abnormal frequency of this condition is noted in amoebic dysentery and sprue, and, it is suggested, may be of value in differential diagnosis.

A. G. B.

RADSMA (W.). **Over het Ca-gehalte van het bloed, in het bizonder in de tropen.** [On the Ca-content of the Blood, especially in the Tropics.]—*Geneesk. Tijdschr. v. Nederl.-Indië.* 1923. Vol. 63. No. 6. pp. 854–863. [2 refs.]

The assertion, especially by clinicians, that the blood in the tropics contains less calcium than in Europe, incited the author to this study. For methodological details the original paper should be consulted. The result is that the calcium content of the blood (9·2-10·7 mgm. per cent. in serum, 5·9-6·85 mgm. per cent. in whole blood) in the tropics practically agrees with that found in Europe and America.

W. J. Bais.

DIXON (W. E.). **Smoking of Indian Hemp and Opium.** [Correspondence].—*Brit. Med. Jl.* 1923. Dec. 15. pp. 1179–1180.

By excellent arguments the writer of this letter supports the view, held by reasonable people, that it is by the individual manner of their use, and not by the methods of the political partizan, that Indian hemp and opium should be judged. He quotes the words of Dr. GILES, the professor of Chinese in Cambridge, who spent many years in China—that " an opium-smoker may be a man of exemplary habits, never even fuddled, still less stupefied," and he points out also that morphine and allied alkaloids are largely destroyed or deposited in the pipe, not absorbed by the smoker. As regards Indian hemp he refers, *inter alia*, to the finding of the Royal Commission of 1894 " that the moderate use of Indian hemp-drugs produces no injurious effects upon the mind," and incidentally he points out that Indian hemp is active only when quite fresh or preserved in sealed tins, and that for vicious smoking purposes the stuff usually obtained in this country is, however unpleasant, not different from any other dried herb.

A. A.

LAUBENHEIMER (K.). **Ueber die Einwirkung von Metallen und Metallsalzen auf Bakterien und Bakteriengifte. Versuche zur praktischen Verwertung der oligodynamischen Wirkung von Metallen.** [The Action of Metals and their Salts on Bacteria and Bacterial Poisons.]—*Ztschr. f. Hyg. u. Infektionskr.* 1921. Mar. 5. Vol. 92. No. 1. pp. 78–114. [33 refs.]

Metallic silver appears to exert a toxic action on bacteria in water only when the organisms are scanty; should the water be grossly contaminated with organisms or with sewage it exerts no effect whatever. Colloidal silver and metallic copper inhibit, to some extent, a production of tetanus-toxin ; but metallic silver does not. The diminution in virulence apparently takes place through disturbance of the "toxophore" group. The action of metallic copper takes place in physiological saline as well as in distilled water ; copper chloride acts in the same way and has a similar action on diphtheria toxin. The *endotoxins* of the dysentery (Shiga) bacillus are affected in the same manner as are the exotoxins of tetanus and diphtheria. Rabbits can be immunized by endotoxins acted upon by copper against many times a lethal dose of pure endotoxin, while silver has no such action. Typhoid bacilli killed with metallic silver yield a vaccine which is practically free from toxic properties ; for this purpose silver-lined flasks are used. Experiments with the dysentery bacillus on similar lines lead to unfavourable results. Shiga bacilli killed in this manner with silver still retained their toxic properties for rabbits. Copper, on the other hand, while killing these organisms attenuated their toxins, so that rabbits could easily be immunized. Paratyphoid B bacilli treated in the same manner also lost their toxic properties, while a high degree of immunity was produced.

P. H. Manson-Bahr.

TIXIER (Léon). **Les anémies parasitaires (parasites endo-globulaires).**—*Rev. Prat. Malad. des Pays Chauds.* 1923. Nov. Year 2. Vol. 3. No. 3. pp. 189–210. [3 refs.]

This is a review of the existing state of our knowledge of anaemia consequent on malaria and on leishmaniasis. Malarial anaemia is briefly considered in its respective clinical and haematological aspects as it occurs in primary infections, in chronic phases, in malignant infections, and in children and infants, and diagnosis and treatment are discussed generally. The practitioner in the tropics will not find anything in any way unfamiliar.

A. A.

ANIGSTEIN (Ludwik) & MILINSKA (Zofja). **Investigations on Jaundice of Bacterial Origin.**—*Jl. Trop. Med. & Hyg.* 1923. Nov. 15. Vol. 26. No. 22. pp. 337–340. [14 refs.]

During the war an unusual number of cases of disease associated with icteric symptoms were observed, often in epidemic concentration, in the Dardanelles and Roumania, and in the autumn of 1921 similar epidemics attracted the authors' attention in Poland. The clinical phenomena are those of catarrhal jaundice, and the blood examination shows a relative increase of lymphocytes (large and small) and up to 15 per cent. of eosinophilia. In 67 cases in Warsaw diagnosed as "catarrhal jaundice" the serum of 80 per cent. agglutinated *Bacillus aertrycke* Stanley. From the blood (or urine) of these cases were cultivated variously a strain of bacilli corresponding with paratyphoid B and Witts, one closely related to paratyphoid C and to Witts, and one very similar to aertrycke Stanley and to typhoid. The authors, therefore, having at the outset excluded Weil's disease, conclude that paratyphoid bacilli of different types take a part in the aetiology of the catarrhal jaundice in question.

A. A.

HARFORD (Charles F.). **The Psychical Aspect of the Sequelae of Malaria and Dysentery, and their Treatment by Auto-Suggestion.**—*Trans. Roy. Soc. Trop. Med. & Hyg.* 1922. Nov. 16 & Dec. 21. Vol. 16. Nos. 5 & 6. pp. 316–322. (Discussion pp. 322–325.)

As a result of personal experience and from the study of pensioners at the Tropical Disease Clinic the author believes that many supposed malarial or dysenteric relapses in such people are really of psychical origin, and can be relieved by a course of "Couéism." Instances are given.

A. G. B.

EMMANUELE (Attilio). **Su due casi d'infezione associata leishmaniosi interna-melitense.** [Associated Kala-Azar and Undulant Fever.] —*Pediatria.* 1923. June 1. Vol. 31. No. 11. pp. 603–608. With 1 text fig. [4 refs.]

Two cases, children 5 years of age, are described in which kala azar was associated with undulant fever. The former disease was diagnosed by the presence of Leishman-Donovan bodies in the bone marrow, the latter by agglutination of the *Micrococcus melitensis* in high dilution of the serum, and in one case by isolation of the organism from the urine. Treatment consisted in injections of vaccines of the micrococcus followed by antimony tartrate.

H. Harold Scott.

BOSE (J. P.). **Glucose Tolerance Tests and their Interpretation.**—*Indian Med. Gaz.* 1923. June. Vol. 58. No. 6. pp. 241–242. With 5 charts.

From experiments in the conduct of which the author has co-operated it is concluded that by means of glucose tolerance-tests it is possible not only to discriminate simple forms of glycosuria from true diabetes mellitus, but also to contribute to the diagnosis of other diseases with which disturbed carbohydrate metabolism is associated. Thus definite types of bloodsugar curves can be obtained for certain disorders of the ductless glands, such as hyperthyroidism, hyperpituitarism and hypopituitarism, and for a rare variety of kidney disease, which hitherto have been confounded with diabetes mellitus.

The glucose tolerance test is described as follows:

"It has been found by experiment that a normal healthy individual can absorb 100 grammes of glucose without the appearance of abnormal amounts of sugar in the urine. But if the dose is doubled there is always a temporary glycosuria. By giving glucose by the mouth and examining the urine for evidence of glycosuria, it has been found that the limit of tolerance for glucose in normal individuals is about 150 grammes.

"To do the glucose tolerance test the patient is given a light meal in the morning, consisting of one egg and tea or coffee, without sugar. Three hours later the urine is collected, measured, and the amount of urinary sugar estimated. At the same time the blood-sugar content is also determined.

"The patient now consumes 50 grammes of glucose dissolved in 150 cc. of water. This amount of glucose has been found to be sufficient, since it is the type of response we are gauging and not the actual amount of sugar in the blood, at any given moment. Further, for every given individual, the type of curve obtained is identical in form whether 25, 50, 100 or 150 grammes of sugar are given.

"Exactly 15 minutes after the last drop of sugar solution has been consumed, the blood is taken again and the sugar content estimated. The blood-sugar estimation is repeated at ½ hour, 1 hour, 1½ hour and 2 hour intervals after the sugar has been consumed. At the end of one hour and two hour intervals the urine is collected, measured, and the amount of sugar present determined. In this way we have figures for the blood-sugar before the test and ¼ hour after, ½ hour and 1 hour, 1½ hours and 2 hours after the test."

A. A.

RADSMA (W.). & GOELAM. **Bloedsuikerbepaling volgens de methode van Shaffer-Hartmann en de modificatie daarvan door Cohen Tervaert.** [Bloodsugar Estimation by the Method of Shaffer-Hartmann and its Modification by Cohen Tervaert.]—*Geneesk. Tijdschr. v. Nederl.-Indië.* 1923. Vol. 63. No. 5. pp. 787–799. With 1 chart.

Cohen Tervaert's modification makes it possible to use smaller quantities of blood (0·2 cc.) than required for Shaffer-Hartmann's method (1 cc.). For details of both methods the original should be consulted. The authors using both methods at Batavia in Europeans and Javanese obtained blood sugar values conforming to European figures. This is in discordance with the much higher figures obtained by others in the tropics (DE LANGEN and SCHUT, see this *Bulletin,* Vol. 13, p. 43). The authors promise further comment upon this important subject.

W. J. Bais.

MCARTHUR (D. C.). **Syphilis as we see it among the Natives of Bechuanaland To-day. Being a Study of some 1,547 Cases of Syphilis occurring among the Native Tribes of Taung, extending over a Period of Six Years.**—*Amer. Jl. Syph.* St. Louis. 1923. July. Vol. 7. No. 3. pp. 569–607. With 18 figs. [35 refs.]

——. **Syphilis in the Bechuanaland Native : Some Points wherein it differs from that seen in the European.**—*Brit. Jl. Dermat. & Syph.* 1923. Nov. Vol. 35. No. 11. (No. 421.) pp. 411–425. [14 refs.]

A study of 1,547 cases of syphilis among the natives of Taung district in the North West borderland of the Cape Province, Union of South Africa; observed during the author's 6 years' residence as district surgeon with charge of a native dispensary.

This paper is an important one as a contribution to the question of the health of African native races. Further, many of the conclusions which the author draws from his observations are so unusual, in some cases so startling, that it will be necessary to consider them in some detail, as without confirmation they are unlikely to receive general acceptance. Syphilis, it is stated, was introduced into Bechuanaland about 1874, and during the ensuing 30 years spread unchecked among the native inhabitants, so that at the present time it is estimated that from 5 to 25 per cent. of the population are suffering from that disease. During the six years in which observations were made, a register was kept and 1,547 cases recorded therein; of these 1,009 were found to belong to families in which other members were suffering from the disease and were grouped into 286 family groups; 538 cases remained ungrouped. Extracts from this register are given showing family groups, mention being made of case number, sex, age (whether under or over 14 years), a note in one or two words of the lesion found and the relationship between the members of the group. The information contained in this register formed the basis around which the author has written his paper and upon which he has built up his conclusions. The register will indicate, he says, "(1) the wholesale syphilization of families; (2) the *preponderance* of heredosyphilis; (3) the *total absence* of acquired syphilis; and (4) the type of lesion met with." [The italics are the reviewer's, inserted to draw attention to a type of statement met with throughout the paper.] From other parts of the paper one gathers that the author believes that (5) all the evidence is against yaws being involved in the question, (6) visceral lesions are generally absent, (7) there is "insusceptibility of the cerebrospinal axis to attack," (8) there is marked chronicity and slow development of isolated lesions, (9) the common "favoid" condition of the scalp called "wit-kop" is a syphilitic manifestation, (10) amplifying (2), there is a high incidence of syphilis hereditaria tarda, (11) the disease is transmitted to the third and fourth generations. The statement is also made that "evidence of race degeneration in Bechuanaland is abundant . . . . it is the exception to see a fine adult specimen of either sex . . . the explanation is clearly that of syphilization of the community." Glancing at the extracts from the register we see reported a number of persons suffering from a variety of lesions chiefly referred to as gummatous ulcers, syphiloderms, nasal and pharyngeal ulcerations and necrosis among those over 14 years of age and "wit-kop" and mucous plaques under that age. Diagnosis was apparently made on inspection, and in the absence of other evidence we may hesitate to accept all these cases as cases of syphilis.

Pains have been taken to emphasize the family grouping, but groups include such distant relations as second cousins. What does the author wish to show? If it be intended to suggest that these two individuals were cases of the disease inherited from a common great-grand-parent one would like to know more about the other descendants. Again, in "group 9," what value is attached to finding three sisters and a brother with syphilis and then a cousin with the disease five years later? With the idea of demonstrating "the extraordinary family syphilization which has taken place," a family tree (No. 1) referring to family group 283 is figured in four generations; there is no evidence of syphilis in the first and second generations, in the third generation some members are shown as suffering from the disease and some not, but in the fourth generation all cases shown are shown as syphilitics; no mention is made as to whether all members of the fourth generation are shown or only those showing evidence of syphilis, and let it be noted 9 out of the 13 members of the fourth generation only show "wit-kop," thus proving little more than that syphilis is a common disease and so is "wit-kop." It should also be remarked that the relationships as shown in the family tree do not always tally with those indicated in the register. Case 371 in the register is shown as mother of case 1,594; in the tree they appear as sisters! One also casually observes that in the register under family group 93, the woman 314 is shown as under 14 years of age but at the same time to be the mother of three children! Such errors, and they are bound to have been numerous when collecting information in this way, rather detract from the value of the evidence. Turning now to Dr. McArthur's main thesis—the preponderance of heredosyphilis, arguments are brought forward which, to the reviewer at least, are anything but convincing.

To the author "a primary chancre—and particularly a genital sore—is something of a pathologic curiosity," and he thereupon appears to take refuge in believing that all the disease he sees is inherited disease. He says that to produce the amount of syphilis now existing gross sexual promiscuity would have been necessary, a custom he seems to think impossible, "as the native in his own way is not without a standard of morality," while in the next sentence he refers to the revolting practice found among them of using "the axilla or thighs of a young child to secure sexual gratification." He thinks that the disease is contracted in the ordinary way in towns and refers to the "continual migration of natives from country to town, and *vice versa,*" yet because he does not see the primary lesion he seems to believe that they do not occur, while admitting elsewhere that "there is often a history of sores in youth," and that "even if the chancre were evident, it is doubtful if the native would bring it to notice and seek advice for it." He adds that scars of healed ulcers are often seen on any part of the body. Has Dr. McArthur ever seen the statistics in a skin hospital of the number of late syphilides giving no history of initial lesions ? However, having thus persuaded himself that *all* his cases of syphilis are of the inherited disease, he finds it very difficult to explain the symptomatology as he sees it in the native. To quote, "keratitis is only seen occasionally, specific deafness unknown, Hutchinson's teeth simply do not exist." On the other hand, "amongst the more frequent manifestations are mucous plaques, condylomata, tibial periostitis and 'wit-kop,'" and he might have added syphiloderm, a term Dr. McArthur apparently prefers to syphilide, for what reason one does not know. He says of symptoms appearing later in life for the first time—"In fact, one is beginning to suspect that many cases appearing at later periods verging on middle life are instances of syphilis hereditaria tarda," but such cases are surely comparable to those in this country where women at the menopause develop gummata as their first signs of the disease.

In regard to the transmission to the third and fourth generations, Dr. McArthur appears satisfied that he has abundant evidence, though one is more inclined to agree with him when he says "all evidence submitted therefore must be presumptive rather than positive"; the family tree No. 3 given in support of his idea is certainly presumptive rather than positive. Reference, too, must here be made to the photograph (Fig. 1) labelled "a hydrocephalic dwarf," an excellent example of dystrophic dwarf and referred to under third generation transmission. In this photograph one recognizes with something of a shock a perfect example of achondroplasia !

Attention must also be called to "wit-kop," a condition which Dr. McArthur proposes as a new symptom of syphilis and upon which his diagnosis of the disease in many cases depends. It is described as resembling impetigo of the scalp in the earlier stages and later favus, with an age incidence from infancy to puberty and sometimes relapse in later life and is said to be associated with mucous tubercles and condylomata : spontaneous cure sometimes takes place, and it responds to treatment with arsenobenzene compounds. In spite of other observers having found the achorion fungus in these cases the author persists in believing the condition to be a syphilitic one.

To the reviewer it would appear, therefore, that Dr. McArthur has shown that a great deal of syphilis exists among the natives he had under observation, the evidence about yaws is not conclusive, no mention is made of tropical ulcer, gangosa, leprosy, tuberculosis as possible factors. The disease would seem probably to be transmitted from person to person by contact often in early childhood, and the evidence for there being much heredosyphilis is in great part wanting. At the same time it seems very doubtful whether wit-kop is anything but ordinary favus, occurring among a poor class of native, possibly, of course, in a native suffering from syphilis. Much more general evidence would be required before race degeneration due to syphilis could be admitted.

H. S. Stannus.

BRUN & DELAMARE. **Un cas d'arthropatrie tabétique observé chez une femme arabe.**—*Bull. et Mém. Soc. Méd. Hôpit. de Paris.* 1923. Dec. 6. Year 39. Vol. 47. 3rd Ser. No. 35. pp. 1617–1618.

In a scrutiny of North African records of 25 years LACAPÈRE could discover but very few published cases of tabes and only 2 of syphilitic joint-disease. The authors here narrate some details of a case of tabes, with associated lesions of the knee-joint, developed in an Arab woman born and always resident in Tunis.

The symptoms began 14 months ago, with progressive loss of power, formication, and intermittent but not violent pains in the lower extremities. At present there is defective co-ordination aggravated by the trouble in the left knee (which began suddenly 7 months ago), loss of sense of touch and temperature, and complete abolition of patellar and tendon and plantar reflexes. The Argyll-Robertson pupil is evident, signs of aortitis exist, and the Wassermann test is double plus for the blood and treble plus for the cerebro-spinal fluid.

A. A.

WILSON. **Nerve Diseases.**—*Nigeria Ann. Med. & San. Rep. for the Year 1922.* p. 34.

Two cases of tabes are noted, one in a Krooboy who had such extreme incoordination that it required three men to hold him upright. Both responded well to treatment.

A. G. B.

MÜLLER (H.) & SOEKATON (Reksomidjojo). **Over orchitis luetica bij Javanen.** [Orchitis Luetica in Javanese.]—*Geneesk. Tijdschr. v. Nederl.-Indië.* 1923. Vol. 63. No. 4. pp. 675–683. With 2 figs. [17 refs.]

In a series of 459 post mortems of male Javanese syphilitic orchitis (gummous or fibrous) was found in 19 cases. Other etiologic factors (gonorrhoea, tuberculosis, yaws, alcohol) are excluded. In the presence of other tertiary syphilitic lesions orchitis was hardly ever found to be missing; this makes it of clinical importance as well. If the incidence of this affection were the same as in Europe, *i.e.*, 1 : 30 cases, this would mean a serious endemicity in the Malay population of Java (at least in the towns). Though the benign course of syphilis in the Malay-race must be admitted (rarity of congenital syphilis, of syphilis of the vessel wall and of the nervous system), the authors maintain that the disease is widely spread and more common than in Europe.

W. J. Bais.

KORSBJERG (A.). **De bismuthbehandeling van syphilis en framboesia.** [The Bismuth Treatment of Syphilis and Yaws.]—*Geneesk. Tijdschr. v. Nederl.-Indië.* 1923. Vol. 63. No. 5. pp. 751–766. [29 refs.]

After reviewing the recent publications on this subject (trepol, neotrepol, etc.) Korsbjerg gives an account of the favourable results obtained with iodine-bismuth-quinine "Holtappel," the definite chemical composition of which is not stated. It is administered by intramuscular injections in doses of 100–150 mgm. in 10 per cent. emulsion in olive oil. There were no untoward symptoms (sore mouth, albuminuria). Six cases are quoted, in two of which preceding treatment with other antisyphilitics failed. The symptomatic results are very good; the influence on the Wassermann test is not stated.

W. J. Bais.

KIMBALL (O. P.). **The Prevention of Simple Goitre.**—*Public Health Rep.* 1923. Apr. 27. pp. 877–885. With 5 text figs.

Goitre may be fitly treated in this *Bulletin*, for it is common in the Himalayan and Sub-Himalayan districts and in the parts drained by the great Indian rivers (MCCARRISON), as well as in the western provinces of China, is very prevalent in a large district of the Middle Chari region (French Congo), occurs in the Ouelle and Katanga districts of Belgian Congo, and has been reported from Bali island (Dutch East Indies). Though iodine has been employed in its treatment since 1820, and the active principle of the thyroid was shown in 1895 to be a stable compound of iodine, it was not till 1916 that this compound was isolated (KENDALL). MARINE and LENHART have shown that iodine is necessary for normal thyroid function and that the iodine content varies inversely with the degree of hyperplasia, and by the administration of iodine they eradicated goitre from fisheries in Pennsylvania.

Thus the use of iodine as a preventive of goitre was put on a scientific basis. It is sufficient to give it to girls during adolescence and to women during pregnancy; the great majority of goitres in boys and men are congenital and due to insufficient thyroid function in the mother. In 1916–20 10,000 girls in the schools of Akron, Ohio, were examined and about half found to have goitre. About half of those examined received each 3 grains of sodium iodide in the drinking water once daily for two weeks each spring and autumn. The others declined. Of those receiving iodine none developed goitre but two who were in poor health: among the others 27·6 per cent. without goitre at the beginning became goitrous. Moreover in 60 per cent. of those who had it at the first and took iodine the goitre disappeared. The actual figures are given. Even more striking effects have been obtained in Swiss cantons, where a practically tasteless organic iodide has been used. Before treatment in January 1918 the incidence of goitre in all the school children of the Canton of St. Gall was 87·6 per cent.; in January 1922 it was 13·1 per cent. The greatest difficulty is the unpleasant taste of sodium iodide, and now in parts of the U.S.A. chocolate tablets are being employed. Similarly, iodine should be given to every woman in pregnancy.

In endemic goitre districts, therefore, iodine should be given to all girls between the ages of 11 and 16, and to all pregnant women. "Simple goitre is the easiest known disease to prevent."

A. G. B.

DEKESTER & MARTIN. **Le Goitre au Maroc. Spécialement dans la région de Fès. (2e Article.)**—*Maroc-Médical.* 1923. Apr. 15. No. 16. pp. 116–117. [2 refs.]

Between May 1920 and April 1923 the authors at the native hospital at Fez have seen 51 cases of goitre, 35 in women and 16 in men. The distribution is given as far as it could be ascertained. No case has been seen in animals. Exophthalmic goitre is quite exceptional.

A. G. B.

LE DANTEC (A.). **Volumineux goitre parenchymateux. Thyroïdectomie. Guérison.**—*Bull. Soc. Path. Exot.* 1923. June 13. Vol. 16. No. 6. p. 429. With 1 plate.

The goitre, which was removed from a native girl at Dakar, weighed 1,400 gms.

A. G. B.

SCHNEIDER (Otto). **Der endemische Blasenstein in Siam.**—*Ztschr. f. Urol.* Leipzig. 1922. Vol. 16. No. 11. pp. 473–487. With 1 fig.

Stone in the bladder is frequent in the Menam valley, as it is in that of the Canton river and the Nile. The author discusses shortly its causes, the age distribution and diagnosis, and at length measures for its relief. Lithotomy is preferred to lithotrity on the grounds that the patients are of a slight build so that the usual instruments are too large ; nearly half are under the age of 15 ; they are country folk and desire speedy relief, and best of all to return in a fortnight with the stone in a handkerchief. Perineal section is done in not more than 3 per cent. of cases, in the rest the high operation. In case of evidence or suspicion of beriberi, malaria or yaws local anaesthesia is preferred to chloroform.

A. G. B.

MENDOZA-GUAZON (Maria Paz). [In English and Spanish.] **Calculi among Filipinos. Calculos entre los Filipinos.**—*Jl. Philippine Islands Med. Assoc.* 1923. July-Aug. Vol. 3. No. 4. In English pp. 169–193. [26 refs.] In Spanish pp. 209–219.

In his statistics of the mortality from biliary and urinary calculi HOFFMANN states that Copenhagen and Manila have an excessive frequency of both conditions. The author examined the necropsy findings of the College of Medicine, University of the Philippines, from 1907 to 1923, comprising 8,649 records of Filipinos, 5,562 males and 3,087 females. Calculi in the biliary tract were found in 131 (75 males and 56 females), and in the urinary tract in 90 (71 males and 19 females). The net result is that lithiasis was found in 2·5 per cent. of Filipinos.

The author concludes that the incidence and mortality of cholelithiasis and urinary lithiasis in this series of cases is high, that both conditions are most frequent in the third decade, that the incidence of cholelithiasis in the sexes is 1·5 males to 1 female, that vesical calculus is very rare among Filipino women, that in a semi-tropical country the danger of cholelithiasis is increased by the migratory activities of ascarides, that ascarides may ascend the biliary tract and either their eggs or the worms themselves become the nucleus on which bile pigments may be deposited, that the hypothesis that avitaminosis is the cause of either gall or urinary stones is not supported by this study, and that the large number of infections and carriers in the Philippines is one of the causes of the great incidence of cholelithiasis.

The paper contains much detailed information in the text and in tables which should be consulted by persons particularly interested in its subject.

A. G. B.

GOMEZ (Liborio) & NAVARRO (Regino). **Diphtheria Carriers and their Significance in the Philippines.**—*Philippine Jl. Sci.* 1923. June. Vol. 22. No. 6. pp. 559–566. [6 refs.]

In previous papers on diphtheria in the Philippines the authors have shown that the disease is rather infrequent, not epidemic, and with somewhat high mortality in spite of antitoxin treatment ; the Schick reaction showed that 8·5 per cent., mostly young children, of 1,030 individuals tested were susceptible (this *Bulletin*, Vol. 17, p. 421 ; Vol. 20, p. 666). Here they study the carrier, for which purpose they cultured material from the throats of 1,775 healthy persons (1,222 children) and tested by animal inoculation the virulence of strains of diphtheria isolated. Virulence was attributed to strains which killed guineapigs in 4 days with the production of certain lesions. Details of the technique are given.

" Summary. 1. At least a certain percentage (2·08) of healthy individuals in the Philippine Islands harbour diphtheria bacilli in their throats.

" 2. The diphtheria bacilli harboured in healthy persons have been found non-virulent in about 89 per cent., and virulent in about 11 per cent. of the carriers.

" 3. In a school where two cases of clinical diphtheria developed, and where carriers of both non-virulent and virulent bacilli were found, the disease has not spread to the other children of the school, or to the other people with whom the carriers and cases came in daily intimate association, which confirms the notion that the disease does not become epidemic in Manila.

" 4. In spite of the continuous existence of carriers of non-virulent bacilli and the occasional existence of virulent one in persons living in institutions where a certain number have been proved to be susceptible to the disease by Schick's test, no clinical diphtheria has ever been known to develop among the inmates.

" 5. From the above data one must conclude that, for the control of diphtheria in the Philippines, it is only necessary to examine the throats of the individuals who have come in intimate contact with cases, to isolate those who are carriers, and to liberate them later if the animal tests show that the bacilli they harbour are not virulent."

A. G. B.

VARDON (A. C.). **Diphtheria Bacillus Carriers in a Mixed Indian Population.**—*Indian Jl. Med. Res.* 1923. Oct. Vol. 11. No. 2. pp. 611–620.

The Indians in question were visiting Kasauli for Pasteur treatment. A single nose and throat culture was made of each individual within a day of arrival from the plains. A thousand cases were examined (810 male, 190 female), and 2,000 swabs; 49 cases, or 4·9 per cent., were morphologically positive, and 7 of those (all male) were found to be carriers of a virulent strain. These findings are analysed by age groups, occupation, provinces, throat condition and seasonal incidence. The technique is given and the sugar reactions described. All the 42 strains isolated were inoculated into guineapigs.

The conclusions are as follows.

"A fairly high percentage of Indians, roughly 5 per cent., harbour organisms in their nose and throat which are morphologically indistinguishable from *B. diphtheriae.*

"2. About one-seventh of these are carriers of virulent strains.

"3. A higher percentage (about three times as many) of carriers of all strains and particularly of virulent strains is to be found among those with pathological throats.

"4. In a search for carriers it is as important to take nasal swabs as throat swabs, since at certain periods positive results may be obtained more frequently from the nose than from the throat."

A. G. B.

PANAYOTATOU (Angélique G.). **Quelques mots sur l'affection diphtérique et surtout la diphtérie primitive du nez. 14 cas primitifs de diphtérie nasale prouvés par l'examen miscroscopique, et le traitement par le sérum spécifique.**—*Rev. Med. et Hyg. Trop.* 1923. July-Aug. Vol. 15. No. 4. pp. 121–134. [4 refs.]

An account of cases of nasal diphtheria in children at Alexandria. The author notes the mildness, the restriction to the nose, the absence of fever and swollen glands, and the small quantity of serum needed for cure [20–40 cc., number of units not stated.] This form of diphtheria and the uses of the Schick reaction are discussed in an interesting and lucid manner.

A. G. B.

FOX (E. C. R.), MCDONALD (E. J. C.) & YOUNG (T. C. McCombie). **The Schick Test and Immunisation by Toxin-Anti-Toxin in Assam.**—*Indian Med. Gaz.* 1923. Sept. Vol. 58. No. 9. pp. 419–422. [6 refs.]

At Shillong, a hill station, there are three schools for European children which receive boarders from all over India. In 1917 there was an outbreak of diphtheria at one of these schools with 40 cases, in 1918 16 cases, in 1919 and 1920 2 and 3, and in 1921 26, and the schools were emptying. In the Schick test, which is described, a negative reaction means that the subject has 1/30 of a unit of diphtheria antitoxin per cc. in his blood, which is sufficient to protect him; a positive reaction shows the subject to be susceptible. Toxin-antitoxin immunization consists in three injections at weekly intervals of 1 cc. of diphtheria toxin suitably neutralized with antitoxin.

It was decided to test all the children by Schick and to immunize those which gave a positive reaction. The first supply of toxin for the Schick test, procured from America, proved to be inert, but a later supply from the Wellcome Bureau Laboratory was potent, as was toxin-antitoxin received from America. The table shows the results of the Schick tests.

Showing the Results of the Tests in the Three Schools.

Name of School.	No. tested.	No. positive.	No. of pseudo-reactions.		No. doubtful.	Percentage positive.
			Positive.	Negative.		
St. Edmund's College	143	57	2	3	6	39·9
Pinemount School ..	49	21	0	0	2	42·8
Loretto Convent ..	79	47	2	5	6	59·5
Total	271	125	4	8	14	46·1

Of the 125 children found to be positive 121 were inoculated with toxin-antitoxin ; two months after the last injection 13 Schick positives were retested and gave a negative reaction. During the term which followed a case of diphtheria with virulent bacilli occurred in a Schick negative, bacilli persisting, but there was only one instance of spread, in a boarder who had been overlooked and had not been tested.

The authors conclude that the toxin for the Schick test and the toxin-antitoxin mixture can retain potency after a journey to India during the hot weather months and give useful results as elsewhere. All new pupils are now being tested and immunized.

A. G. B.

BRACHIO (J. J. A.). **Iodine in the Treatment of Malaria, Kala-Azar and Small-Pox.**—*Indian Med. Gaz.* 1923. July. Vol. 58. No. 7. pp. 311–313.

The author of this paper would appear, from his own account, to have found the panacea for all ills. Driven to the use of iodine as a result of shortage of other drugs, he found it served him " efficiently on several occasions in cholera, small-pox, influenza, intestinal colic, diarrhoea, dysentery and a host of other complaints. . . . . The results were most gratifying. And now in the Suri Jail quinine is a thing of the past, and iodine has practically taken the place of all other drugs for the treatment of fevers, bowel complaints and septic conditions." The action of iodine in malaria is equally miraculous, and the author gives his reasons for discontinuance of the unpleasant and expensive remedy quinine. Kala azar also is a disease which is now found to come under the influence of iodine, and the author hastens to lay before the profession a résumé of his experience and observations in the treatment of kala azar. A solution of

Iodum	6 grs.
Pot. iod.	6 grs.
Aqua distillata	1 oz.

is prepared. Forty minims of this solution, which contains half a grain of iodine, are injected every other day up to 5 injections and then 10 drops of tincture of iodine are given by the mouth three times a day during the course of one week. Nourishing food and tonics may be given to complete the recovery. The treatment appears to be simplicity itself, but the paper, unfortunately, does not give the evidence which is required to carry conviction.

C. M. Wenyon.

JEUDWINE (W. W.). **The Therapeutic Value of Intravenous Iodine. Based on Three Years' Experience on 400 Cases.**—*Indian Med. Gaz.* 1923. Dec. Vol. 58. No. 12. pp. 561–571.

The author finds that the introduction of iodine into the veins results in a general hyperleucocytosis, that chronic ulcers heal rapidly, incipient pulmonary tuberculosis is arrested and later cases benefited, cases of chronic bronchitis are much improved and corneal ulcers quickly cured. He uses 1 or 2 cc. of the tincture, diluted to 10 cc., as a single dose, or an equivalent quantity of a solution of iodine in potassium iodide, or Nesfield's water sterilizing tablets; in each case ½ to 1 grain of iodine. Very full details are given of the technique. A temperature reaction is to be welcomed. Iodism has occurred twice. The reports of cases occupy nearly 7 pages of small type. [See also this *Bulletin*, Vol. 18, pp. 281–2.]

A. G. B.

HILL (Owen A. R. Berkley). **A Plea for the Inception of a Mental Hygiene Movement in India.**—*Indian Med. Gaz.* 1923. June. Vol. 58. No. 6. pp. 242 244.

The author is of opinion that the substitution by the Indian Government of the expressive designation "Mental Hospital" for the term "lunatic asylum" implies the full recognition by official India of the value of psychiatry. It is said that psychiatry in India has been a neglected field; that in some of the largest and wealthiest towns in the land there is not a single specially qualified physician to whom a mental case can be referred for advice and treatment--and that nobody seems to care. The author recommends that each Presidency should now begin by engaging two or three such specially qualified physicians; that a psychopathic ward should be instituted in every hospital where students are trained; and that the special staff, besides working in co-operation with the local magistracy and with the Jail and Education Departments, should keep in close touch with philanthropic and missionary societies and should also endeavour to enlist the interest of the public by lectures, etc. Of course the objection will be raised that there is no money available, since the Indian Local Governments do not yet realise that "one mental disorder, namely dementia praecox, probably costs India more in maintaining its helpless victims for life than any other single disease."

A. A.

ENGELHARD (C. F.). **Het onderzoek naar geestesgesteldheid met behulp van platen, toegepast bij den Javaan.** [The Testing of the Mental Condition by Means of Pictures, applied to the Javanese.]—*Geneesk. Tijdschr. v. Nederl.-Indie.* 1923. Vol. 63. No. 5. pp. 734–750. [12 refs.]

The author's experiments with Javanese village people, not accustomed to see pictures, showed usually a child-like degree of intelligence in this respect. Comparatively, enumeration of the features of the pictures had the best results, description appeared more difficult, explanation of the meaning ranked still lower. This paper contains only the conclusions of experiments a full account of which is given in the author's graduation thesis.

W. J. Bais.

De Langen (C. D.) & Lichtenstein (A.). **Leukocytic Blood in the Tropics.**—*Meded. Burgerlijk. Geneesk. Dienst in Nederl.-Indië.* 1923. Part 3. pp. 293–298. [8 refs.]

The authors criticize the estimated number of leucocytes stereotyped in text-books of tropical medicine as being too low ; it appears to have been adopted from an antiquated European formula. From their own observations in Java they conclude that in normal blood, in the tropics, the total number of leucocytes per cmm. is 8,000 to 9,000, having the following percentage composition : mast cells, 0·5 ; eosinophiles, 5·0 ; lymphocytes, 40·0 ; large mononuclears and transitionals, 3·5 ; neutrophile polynuclears, 51·0. These differ very little from recent European figures.

To give some necessary details of their work. They examined 98 healthy persons, 28 being European, 7 Chinese, and 63 natives of Java—all on an empty stomach ; the differential counting was made obliquely across the whole breadth of the smear, and 400 leucocytes were counted in each case.

The absolute number of leucocytes was as follows :—

	Minimum.	Maximum.	Average.
28 Europeans	5,200	9,900	7,300
7 Chinese	6,100	9,200	8,000
63 Natives	4,900	17,700	9,300

The *percentages* of different kinds of leucocytes were as follows :—

28 Europeans—	Minimum.	Maximum.	Average.
Mast cells	0	1·75	0·5
Eosinophiles	1·25	6·75	3·15
Large mono. & trans.	0·75	9·1	3·5
Lympho	25·0	58·5	41·6
Neutroph. polyn.	32·75	76·5	51·0
72 (sic) Asiatics—			
Mast cells	0	2·5	0·5
Eosinophiles	0·5	17·5	5·9
Large mono.	1·0	6·0	3·2
Lympho.	18·0	65·0	38·6
Neutroph. polyn.	31·5	73·0	51·5

A. A.

De Langen (C. D.) & Djamil (Mohd.). **Idiopathic Hypereosinophilia.**—*Meded. Burgerlijk. Geneesk. Dienst in Nederl.-Indië.* 1923. Part 3. pp. 316–326.

A full and critical account of an enigmatical case in which the percentage of eosinophile leucocytes ranged between 75 and 85. Eosinophile leucocytes were also found in the sputum, in the pus of an experimentally produced abscess, and apparently in a piece of skin removed from the thigh.

The patient was a well-nourished Sundanese man of 30 years. He came complaining of lassitude and an attack of " tightness of the chest," and stated that such attacks, coming on in the evening, had been occurring for about 5 years—rarely at first, but every 2 months during the last year. Previous to these recurrent attacks " he had practically never been ill." He appears to have been most exhaustively and perspicaciously examined, and practically all that could be elicited, besides the extraordinary eosinophilia, were some chest sounds that might have justified the reasonable diagnosis of bronchial asthma, and a much-accented second pulmonary heart sound. Naturally also, the suspicion of ankylostomiasis was followed up, although no eggs were found in the faeces; a specific treatment brought away 33 hookworms, but a second treatment produced nothing.

During the patient's stay in hospital the following observations are noted. The blood-count on two successive days shortly after admission gave the total number of leucocytes 12,400–13,200; percentages of eosinophiles, 75·0–85·0; of lymphocytes, 11·5–3·0; of "segmented nucleated," 5·0–8·0; of mononuclear and transitional 3·5–2·0; of basophiles, 0; of myelocytes and metamyelocytes, 0; of young myelocytes, 5·0–2·0. Haemoglobin, 80 per cent. Subsequently, the total number of leucocytes varied between 12,000 and 26,000, but the total number of eosinophile oscillated between the same values. In the majority of the eosinophiles the granules were remarkably small. The spleen gradually became enlarged; on admission it was not palpable; 3 months afterwards it was two-fingers below the costal arch, and firmly elastic to the touch.

Experimental observations during stay in hospital: Artificially-produced pyrexia caused a "fairly considerable" reduction in the number of eosinophiles for the time only. On a strict vegetarian diet the eosinophiles fell to 51 per cent.; with foods rich in purin the percentage rose to 85. The vago-neurosis theory of eosinophilia was considered, but the increase of uric acid in the urine though constant was very small. The suggested association between eosinophiles and Charcot-Leyden crystals was investigated with the result that by incubating the patient's blood, under strict asepsis and in anaerobic conditions, at 37° C. (with proper controls) Charcot-Leyden crystals were actually formed inside some eosinophile cells, within 24 hours.

After excluding all known causes of eosinophilia the authors have to fall back on a nominal diagnosis of idiopathic hypereosinophilia.

Searching the medical record they descry the following cases that agree with their own in certain essentials: (1) A case from New York reported in 1912 by STILLMAN as "Myeloid leukaemia with predominance of eosinophil cells"; in this the lymph-glands and the liver were enlarged, as well as the spleen, and there was some albumin and some casts in the urine. (2) A case of "Persistent eosinophilia, hyperleucocytosis and splenomegaly" reported by VAN GIFFEN, from the Mayo clinic in 1919; here also there was enlargement of lymph-glands. (3) A case by HUBERTIN and GIROUX in the *Presse Médicale* of 1921, where along with extraordinary eosinophilia and fluctuating leucocytosis the other salient phenomenon was cardiac insufficiency due to sclerosis of the pulmonary artery; here in the course of at least four years the spleen was but very slightly enlarged. (4) A case by MACDONALD and SHAW reported in the *British Medical Journal* of Nov. 18, 1922, under the title "Persistent Eosinophilia with Splenomegaly." (5) A case, from Edinburgh, of a girl of 12 years under treatment for digestive troubles, with a leucocytosis of 12,000 to 15,000 and an eosinophilia of 85 per cent.

A. A.

CHOPRA (R. N.) & MCVAIL (J. Borland). **Carbon Tetrachloride in Pharmacology and Therapeutics.**—*Indian Med. Gaz.* 1923. Oct. Vol. 58. No. 10. pp. 453–461. With 9 graphs. [11 refs.]

This investigation by a Professor of Pharmacology and the officer in charge of Hookworm Research at the Calcutta School of Tropical Medicine was prompted by the demonstrated value of carbontetrachloride in the treatment of hookworm combined with its cheapness. The available samples contained appreciable quantities of carbon bisulphide and organic impurities; only samples which had been purified were used. The authors tested the action on protozoa, with negative results comparable with those of HOGUE and VAN WINKLE [this *Bulletin,* Vol. 20, p. 784], on the intestine and uterus of small animals with the drug administered by the mouth and by injection, and on the respiratory, circulatory, genito-urinary and central nervous symptoms of small animals. They studied its toxicity in dogs and made experiments on the action in vitro. Finally, they record their clinical observations. Their conclusions are as follows:—

"1. Carbon tetrachloride is the most efficient anthelmintic known for hookworm. It is of little value in *Ascaris* infections and of no value against *Taenia.*

"2. The toxic dose of 1 to 4 cc. per kilo body weight in our experiments is far in excess of the therapeutic total dose of 5 cc., *i.e.*, 0·13 cc. per kilo. which is given as an anthelmintic to a normal individual weighing 65 kilos.

"3. Owing to its low solubility and volatility and consequently slow rate of diffusion, only small quantities are absorbed into the circulation. Large quantities can therefore be introduced into the alimentary canal without untoward effects.

"4. When given in medicinal doses and with a purge to persons organically sound it is safe, provided that the drug is pure and that it is swallowed and does not enter the larynx. Carbon tetrachloride itself and its vapour are very irritating, and if brought into contact with the mucous membrane of the respiratory tract in any concentration may produce a reflex stoppage of respiration and later a stoppage of the heart and death. Therefore it must not be forced on struggling children.

"5. The great contra-indication is a liver with impaired function as is caused by alcoholism, chronic or acute. The liver appears to retain a large proportion of the small quantity which is absorbed and so protects the vital organs from injury. The presence of heavy round-worm infection may also be a contra-indication.

"6. Large and toxic doses of this drug, whether single or divided, have a damaging effect on the liver parenchyma. With therapeutic doses the damage, if any, is temporary and unimportant.

"7. The action of the drug on voluntary and involuntary muscle is depressant. In medicinal doses it is slightly laxative and it has no abortifacient tendencies."

They treated 230 cases in hospital and obtained the best results by giving to adults on two successive days a dose of 70 minims in water accompanied by one ounce of concentrated solution of magnesium sulphate, with foodless periods of 2½ hours before and 3 after. Thus were removed 98·8 per cent. of necators and 87·8 per cent. of ankylostomes. Neither by the urobilin test nor the laevulose tolerance test could they detect any damage to the liver. Many of their cases were complicated by kala azar.

A. G. B.

LAMSON (Paul D.), GARDNER (George H.), GUSTAFSON (R. K.), MAIRE (E. D.), MCLEAN (A. J.) & WELLS (H. S.). **The Pharmacology and Toxicology of Carbon Tetrachloride.**—*Jl. of Pharm. & Experim. Therap.* 1923. Nov. Vol. 22. No. 4. pp. 215–288. With 32 figs. [20 refs.]

The research here recorded in full detail was done at the Pharmacological Laboratory of the Johns Hopkins University at the request of the International Health Board. The authors find that pure carbon tetrachloride is a highly toxic substance but that its toxicity depends greatly upon the mode of administration and the species of animal. Autopsies of 200 animals showed that the liver is the organ chiefly affected. No other lesions of consequence have been noticed.

Some of the conclusions are as follows:—

" 5. Pure carbon tetrachloride has been found to be relatively non-toxic for dogs when given in *single* doses by mouth, even up to 25 mils/kilo (500 times the therapeutic dose). . . .

" 6. Repeated doses of 25 cc. per kilo (as much as 220 cc. daily) have been given to dogs over several days. As much as 2 litres have been given before severe symptoms occurred in 1 animal.

" 7. Carbon tetrachloride may be considered an extremely safe anthelmintic for dogs if given in single therapeutic doses by mouth with proper precautions.

" 8. We have confirmed the findings of Hall and Shillinger that carbon tetrachloride is very toxic to rabbits when given by mouth, death occurring after 4 cc. per kilo.

" 9. The difference in toxicity of carbon tetrachloride for dogs and rabbits may be due to a difference in degree of absorption from the intestinal tract, as both species of animals are equally susceptible to the drug administered by inhalation.

" 10. From the great difference in toxicity of pure carbon tetrachloride in dogs and rabbits it is evident that it is unsafe to infer from experiments on any one species of animals the toxicity for another, as for example, the toxicity in man from these experiments on dogs.

" 11. The administration of carbon tetrachloride by mouth after giving digestible fatty substances, such as olive oil or cream, increases the degree of intoxication as shown by signs and symptoms, van den Bergh's bilirubinemia test, pathological findings, and the phenoltetrachlorphthalein liver function test.

" 12. The administration of alcohol together with carbon tetrachloride by mouth increases the degree of toxicity of carbon tetrachloride enormously, death occurring in many animals, and all the symptoms of intoxication as jaundice, bilirubinemia, bilirubinuria, vomiting and depression, as well as pathological findings and liver function changes, being markedly increased.

" 13. Puppies were found to be much more susceptible to carbon tetrachloride than full-grown dogs . . . . . .

" 17. Intravenous injections of carbon tetrachloride into a branch of the vena cava without anesthesia cause characteristic severe nervous symptoms and temporary loss of consciousness with rapid and complete recovery.

" 18. Intravenous injection of the same amount of carbon tetrachloride into a branch of the portal vein (aseptically) causes great depression, vomiting, diarrhoea, jaundice, bilirubinemia, bilirubinuria and usually death.

" 19. Intravenous injections into a branch of the vena cava under ether show instant stoppage of respiration followed immediately by an intense fall of blood pressure. The respiration returns quickly to normal while the blood pressure remains low for a long time, gradually returning to normal.

" 20. Injection of the same amount of carbon tetrachloride into the portal vein under ether may show no effect on the blood pressure or respiration, although with rapid injection a fall in blood pressure can be obtained. . . . .

" 22. From these experiments on the effect of the path of absorption one might explain the differences in symptoms seen in clinical cases, as well as in our toxicity experiments. 1. Inhalation would cause nervous symptoms, possible death from respiratory or cardiac failure, or rapid and complete recovery. 2. (*a*) Absorption from the intestinal tract if by the portal system would cause signs of severe liver damage, jaundice, bilirubinemia, vomiting, depression and death after a few days. (*b*) Absorption from the intestinal tract if *via* the lymphatics and thoracic duct might cause nervous symptoms, much less liver damage, and recovery as was seen after the administration of carbon tetrachloride and fatty substances. . . . .

" 25. Subcutaneous injection causes local irritation with sterile abscess formation. . . . .

" 29. In the 200 dogs autopsied no worms were found in the intestines of dogs having received carbon tetrachloride by mouth, in doses above 0·05 mil/kilo, while many were found in the untreated animals."

A. G. B.

BOECKER (Eduard). **Ueber die Verteilung des Chinins nach Verabfolgung per os.** [The Distribution of Quinine after Ingestion.]—*Arch. f. Experim. Path. u. Pharm.* 1923. Vol. 99. No. 3/4. pp. 200–205. [5 refs.]

The author refers to some former observations on the remarkable degree of absorption by the lungs (proportionately to absorption by the liver) of quinine, eucupin, and optochin when these drugs are administered to guineapigs subcutaneously. He now records confirmatory results for quinine given to guineapigs *per os*: the proportion taken by the lungs is much greater than by the liver and increases with lapse of time after administration of the dose. He alludes to the value of these observations in application to treatment of pneumonia.

A. A.

LOUIS & TRABAUD. **Polynévrite émétinique.**—*Bull. et Mém. Soc. Méd. Hôpit. de Paris.* 1923. Aug. 2. 3rd Ser. Year 39. Vol. 47. No. 27. pp. 1273–1275.

The patient was admitted to hospital at Beyrouth on April 13 with dysentery, attended at first by a flux of leucocytes and no amoebae, for which antidysenteric serum and frequent doses of sulphate of soda were given, till April 27, when the character of the stools had changed and amoebae were detected. Small doses of sulphate of soda were continued, and between May 5th and 25th 7 intravenous injections of emetine were given, 0·08 gm. in each, 0·56 gm. in all. The patient then complained of pain in the left buttock and sacral region and kept his bed. On the 25th there was pain in all the left lower limb, increased when the muscles were compressed, and the left buttock was flattened. The sciatic nerve was painful to pressure throughout its course. No change in tactile or thermal sensibility. With electrical treatment in 45 days recovery was complete. Emetine was not found in the cerebrospinal fluid or urine.

The authors cite a case in which similar symptoms came on after a total of 0·24 gm. and remark that emetine poisoning is not merely a matter of dosage. Amoebiasis in Syria, according to them, differs from the disease in North Africa; in Syria liver abscess is rare but amoebic dysentery is very resistant to emetine and the arsenobenzenes, and has a special tendency to relapse, so that for the doctor there is the dilemma of overdose of emetine or failure to cure. They think that emetine does not affect all nerve fibres without discrimination; those are affected by preference which conduct sensibility to pain; suggesting that the toxic action is mainly on the posterior roots.

A. G. B.

VOEGTLIN (Carl), DYER (Helen A.) & LEONARD (C.S.). **On the Mechanism of the Action of Arsenic upon Protoplasm.**—*Public Health Rep.* 1923. Aug. 17. Vol. 38. No. 33. pp. 1882-1912. With 8 charts. [15 refs.]

The authors remind us that EHRLICH has used his side-chain theory to explain the chemotherapeutic action of arsenic, his assumption being that trivalent arsenic is firmly and fatally fixed to a definite chemical component of protoplasm—a hypothetical "arseno-ceptor." They also remind us that Voegtlin and SMITH concluded from experiment that arsenic can exert a direct toxic effect only if present in the form of an aromatic arsenious oxide. Their present argument is that if EHRLICH's assumption be correct it should be possible to inhibit—temporarily, at least—the toxic action of arsenic by supplying the animal cell with an extra provision of the particular constituent of protoplasm that may be supposed to react with arsenic.

As to what this particular constituent of protoplasm may be, the authors have thought it reasonable to assume, from the ease with which aromatic arsenious oxides, including arsenoxide, react with hydrogen sulphide, that it might be something that contained sulphur. Such a substance is glutathione—isolated by Gowland HOPKINS from yeast and from mammalian tissues—a sulphydryl compound.

The authors have therefore carried out a series of experiments with various sulphydryl compounds to test the presumed inhibitive effect of these upon arsenious oxide—a substance which they have shown to be extremely toxic to trypanosomes and to have a great affinity for the tissues of the rat, these being the animals used in their experiments. It is as much beyond the scope of this *Bulletin* as beyond the competence of the reviewer to follow the formal chemical expression of these experiments and their control observations; it must be sufficient to state the authors' conclusion that they "clearly indicate that certain SH compounds are able to counteract the toxic effect produced by arsenoxide on trypanosomes [in vitro, and in the circulating blood] and a representative mammal [rat]; and that they suggest—" in view of the fact that SH compounds appear to occur as normal protoplasmic constituents of all living cells with an active metabolism "—that arsenic in the form of aromatic arsenious oxides may be regarded as a specific poison affecting these particular constituents, and a specific poison that might be counteracted by reinforcing the SH compounds.

A. A.

BROOKS (Matilda Moldenhauer). **Studies on the Permeability of Living and Dead Cells. IV. The Penetration of Trivalent and Pentavalent Arsenic into Living and Dead Cells.**—*Public Health Rep.* 1923. Dec. 14. Vol. 38. No. 50. pp. 2951–2966. With 7 charts in text. [13 refs.]

In investigating experimentally the penetration of arsenic into living (and dead) cells the marine unicellular alga, Valonia, was used, as affording a large succulent cell of which the three components—wall, lining protoplasm, sap—could easily be dissociated and analysed separately. The arsenic compounds were dissolved in distilled water and the solution was then added to the seawater containing the plants. The pH concentration was varied in two ways, by using phosphate buffers and by adding traces of HCl; the use of phosphate buffers may lead to deceptive results and must be "controlled." The presence of arsenic was determined by the Gutzeit method. The following is a summary of essential results :—

"By far the highest concentration of arsenic was found in the protoplasm The great amount of arsenic taken up by the protoplasm points to a combination of arsenic with protoplasm.

"The penetration of both pentavalent arsenic (in the form of As_2O_5 and atoxyl) and trivalent arsenic (As_2O_3) is least when the external solution is nearly neutral. As the H ion concentration of the suspension fluid diverges from neutrality, more arsenic enters, the amount increasing as the surrounding medium becomes either more acid or alkaline. This is true of sap and protoplasm, but not of wall.

"Trivalent arsenic does not penetrate so readily into protoplasm in the acid range as pentavalent arsenic ; but it passes into the sap more readily, except in the range of neutrality.

"Previous exposure of *Valonia* for one hour in a solution of $NaHCO_3$ in sea water increases the accumulation of pentavalent arsenic in the protoplasm by 150 per cent. ; whereas the amount of trivalent arsenic accumulation in the protoplasm is reduced by 25 per cent. Under the same conditions the entrance of trivalent arsenic from the protoplasm into the sap is increased about 100 per cent., whereas that of pentavalent arsenic is increased only about 25 per cent.

"It is suggested that either the bicarbonate ion or the presence of abnormal amounts of free CO_2 increases the permeability of the cell to arsenic."

As regards dead Valonia, the penetration of arsenic from a solution in sea water (in a pH3.6 medium) was found to be much more rapid than in the case of the living cell.

A. A.

AIAZZI-MANCINI (Mario). **Sopra uno strano caso do avvelenamento collettivo da stramonio.** [An Unusual Instance of Collective Poisoning by Stramonium.]—*Giorn. di Clin. Med.* Parma. 1923. Dec. 30. Vol. 4. No. 18. pp. 696–698. With 1 fig.

A gentleman of Florence imported in the summer of 1922 seeds of "giant spinach" and sowed them in his garden. There was abundant growth and in the following June some was cooked for the table. Owing to its bitter taste very little was eaten, but all of the family, three in number, were poisoned, one seriously. The symptoms are described briefly with the exception of the peculiar delirium associated with some members of the Solanaceae, which in the case of one patient is described in detail. The plant proved to be *Datura stramonium* and the cases are recorded, not on account of the symptoms, which were not unusual, but in order to sound a note of warning as to the dangers arising from the unwitting use of this plant for food.

H. Harold Scott.

NICCOLINI (P. M.). **Sopra un caso di avvelenamento da "Nerium oleander."** [A Case of Poisoning by *Nerium Oleander.*]—*Giorn. di Clin. Med.* Parma. 1923. Dec. 30. Vol. 4. No. 18. pp. 691–695. With 5 charts in text.

A case of attempted suicide in Florence by *Nerium oleander.* The patient, a woman of 25 years of age, prepared a decoction of the tops and leaves and swallowed an undetermined quantity. An hour and a half later symptoms set in with violent vomiting and circulatory depression ; the pulse was small, 38 per minute. The stomach was washed out with a solution of tannin and camphor was injected subcutaneously. Vomiting continued for about 10 hours, with diarrhoea. The pulse became very irregular and the beats unequal, but the rate by this time had increased to 60 per minute. The arhythmia and inequality continued for some 24 hours and vague bruits were audible over the cardiac area. Recovery was complete in 3 days.

The poison in its action thus resembles digitalis. [It is noteworthy that there were no convulsions such as occur with *N. odorum*, a closely allied species, which accounts for a considerable number of cases of poisoning in India. This symptom is ascribed to the Karabin present.] A table is given showing the principles extracted from both these plants with their chemical nature and characters. Medicinally, *N. oleander* is used internally as an infusion in a strength of 2·5–5 per cent., or as an extract, for its action as a cardiac tonic and diuretic, and externally as a parasiticide. It is popularly regarded as an abortifacient, as is the *N. odorum* in India, but on insufficient grounds.

H. Harold Scott.

LECLERC (Henri). **Les plantes médicinales des colonies françaises : Le Yohimbe.**—*Presse Méd.* 1923. Sept. 5. Vol. 31. No. 71. (Supplement.) pp. 1486–1488. [9 refs.]

Yohimbe is the bark, much resembling in appearance some kinds of cinchona-bark, of three tropical African species of Rubiaceae, namely *Corynanthe* (or *Pausinystalia*) *yohimbea*, *C. paniculata*, and *P. trillesii*. The decoction has the reputation, among the natives, not only of resuscitating erotic desire but also of insuring very potent performance. It yields an alkaloid, yohimbine, which in the laboratory, in small doses, has been observed to have a rapid and direct specific effect on the erector centre of the male, and in the female to stimulate the ovaries, the uterine mucosa, and the milk-glands. Poisonous doses paralyse the motor centres generally (not affecting the muscles or the motor nerves) and eventually cause death by paralysis of the respiratory mechanism and of the motor ganglia of the heart. Yohimbine has a local anaesthetic effect like cocaine, but as it also causes local hyperaemia its use in this direction is interdicted. The hydrochloride has been used therapeutically in daily doses of 0·015 gm., which may be increased, but cautiously, since, although it has no effect on kidney or other organs, it may cause salivation, gingivitis, haemorrhoidal and urethral irritation, and also pains and cramps. The author records a case of exasperating marital incapacity, following the sealing of a prolonged Platonic attachment, which was completely rectified by a short course of coffee-spoon doses of fluid extract of yohimba bark in a 10 per cent. dilution, after failure of therapeutic doses of the hydrochloride.

A. A.

LECLERC (Henri). **Les plantes médicinales des colonies françaises : L'Iboga.**—*Presse Méd.* 1923. Aug. 15. Vol. 31. No. 65. (Supplemént.) pp. 1360–1361. With 1 fig. [6 refs.]

Iboga is a native name of *Taberne iboga*, an Apocynaceous shrub which is found on the African coast near the equator, and in French and Belgian Congo, and is used by the natives to stave off fatigue and in sleeping sickness. It contains an alkaloid known as *ibogaine*, first studied by French observers in 1901. An account is given of the effects of this alkaloid on animals and man. It appears to share some of the properties of cocaine.

A. G. B.

HEFFERMAN (L.W.). **Stab Wound of Enlarged Spleen.**—*Indian Med. Gaz.* 1923. July. Vol. 58. No. 7. pp. 315–316.

The patient was a Chinaman of 35 years. Before despatch to hospital the external wound was dressed and a dose of morphia was administered. On admission the general condition was good. On opening the abdomen for examination a gush of blood carried some coils of gut with it and caused collapse, which was quickly rectified by injection of two pints of saline, one intravenously, the other into the peritoneal cavity. The wounded spleen was found to be much enlarged; there was also a tear and a small haematoma in the omentum. After ligation of the splenic artery and separate ligation of the pedicle the spleen was removed. The wound in the abdomen was then closed and a fresh suprapubic puncture made for a draining-tube. The wound healed by first intention and the patient made a good recovery, being discharged at his own request on the 20th day. The spleen weighed 5¼ lbs.

A. A.

CADBURY (W.W.). **Blood Pressure of Normal Cantonese Students.**—*China Med. Jl.* 1923. Sept. & Oct. Vol. 37. Nos. 9 & 10. pp. 715–726; 823–833. [36 refs.]

The author discusses, to begin with, from the historic standpoint, the general subject of blood-pressure and the circumstances that influence it, and then the various recorded observations of the blood-pressure of non European races in Bengal, the Philippines, North America and Japan. His own investigations, here tabulated, were made on 774 healthy students of the Canton Christian College, and he remarks that the Cantonese, though shorter and lighter than natives of other parts of China, are noted for energy and enterprise. In his observations he used a Nicholson sphygmomanometer, using the auscultatory method, with the subject sitting and resting the arm. His observations show that the systolic blood-pressure of these Chinese averages from 20 to 30 mm.Hg less than the European normal, and the diastolic pressure 10 to 20 mm. less, but that their average pulse-pressure shows less difference from the normal.

A. A.

i. DA COSTA (A. F. W.). **A Case of Infantile Biliary Cirrhosis.**—*Indian Med. Gaz.* 1923. Dec. Vol. 58. No. 12. pp. 587–588.

ii. MENSE (Carl). **Beobachtungen ueber die Seekrankheit.** [Observations on Sea-Sickness.]—*Arch. f. Schiffs- u. Trop.-Hyg.* 1923. July. Vol. 27. No. 6. pp. 193–197.

iii. RAMSAY (G. C.). **An Unusually Large Supraclavicular Lipoma.**—*Indian Med. Gaz.* 1923. July. Vol. 58. No. 7. p. 316. With 1 fig.

iv. TISNÈS (Léon). **La mutuelle F.A.O.**—*Congrès de la Sante Publique et de la Prévoyance Sociale, Marseille,* 11–17 *Septembre* 1922. *Comptes Rendus.* pp. 451–458.

i. A Hindu child of 13 months took ill in April with fever and loss of weight. A few days before death in August the liver was enlarged five fingers breadth below the costal arch and the spleen to an unstated degree. No record of any microscopic examination.

ii. A general discussion of the subject. The author recommends the use of Afenil, a compound of urea and calcium chloride.

iii. The patient was an old coolie woman, and the tumour, which weighed four pounds and was said to have been growing for 12 years, appears from the photograph to have been considerably bigger than her head. The tumour was inconvenient, not painful, and the wound of removal healed by first intention within ten days.

iv. An article dealing with the insurance of non-official Europeans in French colonies.

A. G. B.

FLEMING (Wm. D.). [In English & Spanish.] **Some Aspects of Basal Metabolism with Special Reference to the Problems of Tropical Medicine. Algunos aspectos del metabolismo basal con referencia especial a los problemas de medicina tropical.**—*Jl. Philippine Islands Med. Assoc.* 1923. Nov.-Dec. Vol. 3. No. 6. In English pp. 308-311. In Spanish pp. 353-357.

LEIPOLDT (C. Louis). **A Note on Cancer among Natives.**—*Med. Jl. S. Africa.* 1924. Feb. Vol. 19. No. 7. pp. 206-207.

PHIPSON (E. S.). **Observations on an Outbreak of Diphtheria at Bishop Cotton's School, Simla.**—*Indian Med. Gaz.* 1923. Sept. Vol. 58. No. 9. pp. 417-419. [1 ref.]

Refers to the epidemic described by SUMNER [see this *Bulletin*, Vol 20, p. 667].

REENSTIERNA (J.). **Recherches sur le bacille de Ducrey. I. Préparation et propriétés d'un sérum antistreptobacillaire. II. Cutiréaction dans le chancre mou.—Son application au diagnostic.**—*Arch. Inst. Pasteur de Tunis.* 1923. Dec. Vol. 12. Nos. 3/4. pp. 273-312. With 4 plates. [57 refs.]

ROSS (Ronald). **The Management of Medical Research.**—*Glasgow Med. Jl.* 1923. Nov. Vol. 100. New Series. Vol. 18. No. 5. pp. 209-223.

REVIEWS AND NOTICES.

FLETCHER (William) [M.D.Camb., Bacteriologist, Inst. Med. Res.] & JEPPS (Margaret W.) [Protozoologist, Inst. Med. Res., Kuala Lumpur] with a Preface by HORN (A. E.), [C.M.G., Med. Secretary, Colonial Advisory Medical & Sanitary Committee.] **Dysentery in the Federated Malay States.**—*Studies from the Institute for Medical Research, Kuala Lumpur, F.M.S.* No. 19. pp. viii + 82. With 44 figs. 1924. London: John Bale, Sons & Danielsson, Ltd., 83–91, Great Titchfield Street, W.1. [Price 10s. 6d. net.]

This work might almost serve as a pattern of what a monograph should be when dealing with such a subject as dysentery occurring in a restricted locality. The conclusions arrived at are set forth clearly and convincingly, and at the same time so modestly that it is only on reflection that the reader realizes the vast amount of work that was necessary before so definite an end could be reached. The whole letterpress is condensed into some 80 pages, the remainder being occupied by forty-four figures which show, as clearly as is possible in black and white reproductions, the type of patient dealt with and the conditions of the intestine found *postmortem*.

The authors, having shown that the vast majority of the cases investigated occurred in pauper coolies, point out that the high death rate is largely due to insufficient diet and inter-current disease.

Passing on to the cause of the dysentery, *E. histolytica* was found in 20 per cent., *B. dysenteriae*, Flexner, in 55 per cent., and *B. dysenteriae*, Shiga, in 3 per cent. The mortality being 20, 30, and 55 per cent. respectively.

In the investigation of these different causative agents, *B. dysenteriae*, Shiga, was found as the cause either of small epidemics or of isolated cases in hospital patients, about half of the latter having the disease in a chronic form. *B. dysenteriae*, Flexner, is far the commonest type of organism met with, and all the serological types described by ANDREWES were found, and in addition another variant related to the Flexner group serologically, which however failed to ferment mannitol.

Amoebic dysentery is much less common than bacillary forms, and no less than 13 per cent. of patients, in whose faeces active forms of *E. histolytica* were recognised, were also found to harbour one or other variety of the dysentery bacilli.

The next subject dealt with is the all important question of carriers, a condition which from the careful study of the abundant *postmortem* material available was conclusively shown to be due to infection of the intestinal mucous membrane and not, as in typhoid fever or cholera, to gall bladder infection. The chief situations where the bacilli were found in such cases being (*a*) in the contents of retention cysts; (*b*) in collections of pus situated beneath thin pigmented scars; (*c*) beneath the edges of chronic ulcers.

Other points dealt with are the importance of cytological diagnosis as a guide to treatment. The importance of employing fresh specimens of faeces for such examinations and for the isolation of the bacilli or the recognition of the *E. histolytica* is fully discussed. As regards the isolation of the bacilli, Teague and Clurman's method of mixing the faeces with a solution of glycerine in salt solution was found to be of considerable value. Various forms of treatment are then discussed, and even when the results were shown to be almost perfect as regards the healing of the dysenteric ulceration, as in the case of the amoebic form treated with emetine, the ultimate result is frequently unsatisfactory, the patients being too weak and emaciated to recover.

This is only a very brief summary of the points investigated, and careful study of the monograph will well repay all workers on this subject.

S. R. Douglas.

DE LANGEN (C. D.) & LICHTENSTEIN (A.).—**Leerboek der Tropische Geneeskunde.** [Manual of Tropical Medicine.]—pp. xiii + 564. With 22 plates (5 coloured), and 10 figs. [no date.] Weltevreden—Batavia—Leiden. G. Kolff & Co. [Price fl. 12·50.]

This book is evidently meant for local use. It is written in Dutch and so its foreign circulation will necessarily be limited. Still it may prove useful to clinicians of other tropical countries who may wish to become acquainted with the local Malay characteristics of various tropical diseases, seeing that the writers are known to possess a large clinical experience, which is collected in this book and is a sufficient guarantee of its merits. As is well known, the Malay Archipelago offers a highly monotonous nosographical aspect, such interesting diseases as trypanosomiasis, leishmaniasis, recurrent fever, etc., being absent (as autochthonous products). These subjects have therefore been treated succinctly. But the authors have been free to enlarge on indigenous diseases like malaria, yaws, dengue and allied fevers, various forms of dysenteries, sprue, cholera, ankylostomiasis and beriberi, where their ripe knowledge is of avail. Some shorter notes on ubiquitous diseases and on nervous diseases in the Malay Archipelago close this valuable book.

N. H. Swellengrebel.

TROPICAL DISEASES BUREAU.

TROPICAL DISEASES BULLETIN.

Vol. 21.] 1924 [No. 6.

MEDICAL ZOOLOGY.

JEPPS (Margaret W.). **Protozoa of the Human Mouth in Malaya: *Entamoeba gingivalis* and *Trichomonas* sp.**—*Parasitology*. 1923. Nov. Vol. 15. No. 4. pp. 343–347. With 5 figs. [7 refs.]

The author examining scrapings from the gum base of the teeth of 50 Indian and Chinese coolies found *Entamoeba gingivalis* in 28 and Trichomonas in 16; but half the cases were examined only once, and organisms are not—and in this series were not—always found at the first examination. *E. gingivalis* has an exceptionally clear cytoplasm, which also appears viscous or adhesive, so that as the creature moves forwards its after part gets drawn out into a tail or tags; notwithstanding the clarity of the cytoplasm, the nucleus, which is very much like that of *E. histolytica*, is seldom visible in life, being obscured by contents of food-vacuoles; the inclusions consist of bacteria and remains of nuclei of leucocytes, red corpuscles were never seen. The Trichomonas is much more actively amoeboid than the intestinal species; its surface, but particularly the after end, may be irregularly rippled with considerably persistent pseudopodia, or drawn into a tail-like wisp or wisps.

A. Alcock.

WILLIS (H. Hastings). **A Note on Intestinal Protozoal Cysts in Man at Townsville, North Queensland.**—*Med. Jl. Australia*. 1923. Dec. 29. 10th Year. Vol. 2. No. 26. p. 682.

In the course of a hookworm campaign in the city of Townsville, 440 specimens of faeces, selected as representative of a collection of 9,441 specimens, were examined—all within 48 hours of being voided—for cysts of Protozoa, etc. Cysts were found in 208 of the 440. The cysts observed were, in their several percentage of the whole 440 specimens examined: *Giardia intestinalis* 19, *Entamoeba coli* 16, *Entamoeba histolytica* 1, iodine cysts 2, *Blastocystis hominis* 25. Various multiple infections were observed in fifty-six instances. The infestation by age-groups is shown in the following table :—

Age, years	No Exd.	G intestinalis	E. coli.	E. histolytica.	I. cysts.	Blastocystis
Under 6	96	35	5	0	0	22
6–18	155	40	31	0	5	44
19–40	143	7	29	4	1	35
41–60	43	1	5	1	1	8
Over 60	3	1	0	0	0	0

A. A.

Boeck (William C.) & Stiles (Ch. Wardell). **Studies on Various Intestinal Parasites (especially Amoebae) of Man.**—*U.S. Public Health Service, Treasury Dept. Hygienic Laboratory. Bull. No.* 133. Washington. 1923. Oct. pp. xxvi + 198. With 80 figs. [60 refs.].

This is one of the numerous progeny begotten by War upon fear of infection from repatriated troops, especially of intestinal protozoon infections. It contains a review of recent and familiar work on the prevalence of these infections—and also of their prevalence apart from any special military influences—in England, and the details of a survey of the same aspects of the subject in the United States of America. From this survey it appears that the ratio of these infections was found to be higher in America than in England [which is almost what one would expect from the greater prevalence in the former country of extensive tracts where sanitation is of the rural sort]. It also contains much useful technical information upon the manipulation and examination of faeces, and descriptions and plentiful figures of the commoner intestinal Protozoa ; but 4 of the plates bear neither number nor legend. Of the 198 pages, 73 are devoted to the interminable subject of nomenclature. There are some interesting observations on the vitality—as judged by reaction to eosin stain—of cysts : in stools washed free of bacteria and their products and then treated with distilled water cysts remained alive for months, and cysts of *E. histolytica* appeared to retain life for five days in a 5 per cent. solution of formalin. The thermal death-point for cysts of *E. histolytica* was observed to be 68° C. ; for those of *Giardia " lamblia "* 64° C.

A. A.

Hegner (Robert W.). **Infection Experiments with Trichomonas.**—*Amer. Jl. Hyg.* Baltimore, 1924. Mar. Vol. 4. No. 2. pp. 143–151. [9 refs.]

The experiments here recorded in adequate detail were based on 24 stock white rats, 12 of which were kept as controls, and one wild rat. In the ordinary routine an individual rat was kept secluded without food for 18 to 36 hours and was then supplied with a little milk rich in active forms of *Trichomonas muris* ; subsequently, at an interval varying from half-an-hour to 29 hours, the rat was killed and the contents of its stomach, caecum, and of selected portions of its small intestine were examined. The results of these examinations satisfy the author that *Trichomonas muris* in the active flagellar stage can pass unhurt from the mouth to the caecum of the rat. The wild rat was submitted to an operation that permitted the contents of its caecum to be removed, thoroughly examined, and pronounced free from *Trichomonas muris*. Milk containing the active flagellates was then thrown into its stomach by catheter, and similar milk was placed in its cage and was consumed by it soon after its recovery from the operation. It was thereafter kept and carefully nourished for 4 days, and then killed, when samples taken from its caecum were found to contain large numbers of *T. muris* of various sizes. From these observations, in conjunction with the facts that *Trichomonas hominis* is remarkably tenacious of life outside its host's intestine and has never been found, authentically, in the encysted stage, the author justifies the conclusion that the mode of infection of man is analogous with that of the rat.

A. A.

FRANCHINI (G.). **Sur des cultures très anciennes de flagellés.**—*Bull. Soc. Path. Exot.* 1924. Jan. 9. Vol. 17. No. 1. pp. 32-35.

In this author's experience blood-bouillon and latex-bouillon are specially favourable media for the cultivation of certain flagellates. He has observed Herpetomonas in latex-bouillon cultures as much as 11 months old, and *Trypanosoma cruzi* in such cultures at 10 months. In these old latex-bouillon cultures encysted forms and forms apparently on the way to encystment are sometimes found. He has had much the same experiences with blood-bouillon cultures.

A. A.

BECKER (Elery R.). **Transmission Experiments on the Specificity of** *Herpetomonas muscae-domesticae* **in Muscoid Flies.**—*Jl. Parasit.* 1923. Sept. Vol. 10. No. 1. pp. 25-34. [5 refs.]

The author's investigations show that the type of Herpetomonas known as *H. muscae domesticae* can occur, naturally, in *Phormia regina, Lucilia sericata, Sarcophaga bullata, Cochliomyia macellaria* and *Calliphora erythrocephala* as well as in *Musca domestica*. His experiments, here recorded in sufficient detail, show that the Herpetomonas from any one of these 6 species taken in nature can infect clean laboratory-bred individuals of the other 5 species, and that such laboratory-infested individuals then become "carriers" infective to individuals of other species. And his "extremely probable" inference is that *H. muscae domesticae, H. luciliae, H. calliphorae, H. sarcophagae* and the Herpetomonas from Phormia and Cochliomyia "all represent the same species." The author's work gives pause to the easy assumption that a form found in a specific host where it had not before been observed must necessarily be a new species.

A. A.

TALIAFERRO (William H.). **A Reaction Product in Infections with** *Trypanosoma lewisi* **which inhibits the Reproduction of the Trypanosomes.**—*Jl. Experim. Med.*. 1924. Jan. 1. Vol. 39. No. 1. pp. 171-190. With 4 figs. [2 refs.]

In the author's experiments, when trypanosomes (*T. lewisi*) were injected into the blood of a susceptible rat along with serum from a rat that was in the full tide of a trypanosome infection, the trypanosomes did not "reproduce" for at least 13 days (beyond which the observations were not carried); whereas when trypanosomes from the same source were injected along with normal serum, "reproduction" in the blood of the susceptible rat began two days afterwards. The author therefore infers that the serum of rats fully infected with *T. lewisi* contains something obstructive to the trypanosome—a reaction product.

The author estimates the "reproduction" of the trypanosome by serial observations of the blood of a rat during the course of an experimental infection. If in a given sample of the series there be great variability in the size of the trypanosomes observed, reproduction is active; if there be no such variability reproduction has ceased.

A. A.

PONSELLE (A.). **La culture de** *Trypanosoma inopinatum.* **Trypanosome pathogène de la grenouille.**—*Ann. Parasit. Humaine et Comparée.* Paris. 1923. June. Vol. 1. No. 2. pp. 155–158. With 1 fig. [4 refs.]

The author succeeded in culturing *T. inopinatum* by adding a drop of heart blood from an infected *Rana esculenta* to a medium consisting of equal parts of defibrinated rabbit's blood and of water twice distilled, inactivated at 56°C. for 30 minutes. The next day, Crithidia were found in a state of active multiplication: 4 days later these forms were numerous and were found either in rosettes or isolated; in 10 to 15 days the cultures were extremely rich. All the inoculated tubes succeeded and blood cultures were easily made. *Rana esculenta* inoculated with fourteenth and nineteenth sub-cultures became infected, but *Rana temporaria* proved resistant, just as it had previously been shown by BRUMPT to be resistant to the bites of infested leeches, although it could be infected by direct inoculation of infected blood. The conditions under which *T. rotatorium* and *T. inopinatum* can be cultured are quite distinct. If the two trypanosomes be inoculated into tubes, one containing blood bouillon with a PH content of 6.3 and the other equal volumes of blood and distilled water, it is found that only *T. rotatorium* will grow in the former and only *T. inopinatum* in the latter.

W. Yorke.

KUDICKE (R.) & EVERS (E.). **Ueber den Einfluss von Zuckerarten und Alkoholen der Zuckerreihe auf die Beweglichkeit der Trypanosomen in vitro.** [The Influence of Various Sugars and their Alcohols on the Motility of Trypanosomes in vitro.]—*Ztschr. f. Hyg. u. Infektionskr.* 1924. Vol. 101. No. 3. pp. 317–326. [10 refs.]

This paper contains the results, tabulated, of experiments to determine the influence of different sugars and their alcohols upon the motility of trypanosomes *in vitro.* Of the numerous solutions tried those of glucose, mannose, levulose and maltose were found to be most favourable to trypanosomes; they retained their motility for 6 hours (at 37°C.) in solution of glucose varying in strength from 1 in 200 to 1 in 3,000, and in solutions of mannose, levulose, and maltose varying in strength from 1 in 100 to 1 in 3,000. A certain proportion of trypanosomes retained vitality in solutions of glycerine, 1 in 50 to 1 in

400, even up to 6 hours ; and of galactose (1 in 50 to 1 in 100), of sorbite (1 in 50 to 1 in 400), and of lactose (1 in 100 to 1 in 1,000) for one hour.

A. A.

MAZZA (Salvador). **Sur la durée de l'immunité relative dans le paludisme des oiseaux.**—*Arch. Inst. Pasteur d'Algérie.* 1923. Dec. Vol. 1. No. 4. pp. 609–611.

The brothers SERGENT, by a very large series of experiments, have established the facts that after a primary acute stage 70 per cent. of canaries surviving a Proteosoma infection retain for a long time a chronic infection, with a possibility of mild and irregular relapses ; that during this chronic stage the blood is infective, although parasites cannot be found in it ; and that if in this stage a bird be re-inoculated the result, as apparent in the peripheral blood, is little, or is nothing at all and justifies the inference that the bird has acquired a certain amount of immunity such as is attributed to old settlers in a malarious country.

The present author records here the results of some experiments with three such canaries, one of which had been infected $4\frac{2}{12}$ years (or $4\frac{7}{12}$ years) and the other two $3\frac{3}{12}$ years before. Of two fresh birds inoculated from the plus four-years' canary one took a mortal infection and the other was unaffected. The two $3\frac{3}{12}$ years' birds being re-inoculated took infection just like fresh birds—they at least had not acquired any immunity. (The blood of these two $3\frac{3}{12}$ birds was also tested and found to be wanting in any power to confer immunity on fresh birds.)

A. A.

CASTEX (Mariano R.) & GREENWAY (Daniel). **Coccidiasis humana por** *Isospora hominis.* [Coccidiosis in Man—*Isospora hominis.*]—Reprinted from *La Prensa Medica Argentina.* 1923. Aug. 20. 11 pp. With 3 figs. [7 refs.]

A summary of human coccidiosis is given with an account of Eimeria and Isospora and a brief review of recorded cases. The authors recognise three distinct clinical types: hepatic, intestinal (with definite dysenteric symptoms), and faecal. The last is benign, giving rise to no definite symptoms except the presence of oocysts in the stools and an eosinophilia. The additional case here recorded was a man of 34 years passing the oocysts (31·75 microns in length, 13·15 in width) in large numbers. His blood showed 14 per cent. eosinophiles. Capsules of narsenol [dose not stated] were given for ten days, by which time the eosinophilia fell to 5·66 per cent. and the parasites were no longer discovered in the faeces.

H. Harold Scott.

PHISALIX. **Coccidiose intestinale de la Vipère aspic à** *Cyclospora Viperae* **n. sp.**—*Bull. Soc. Path. Exot.* 1923. Nov. 14. Vol. 16. No. 9. pp. 637–642. With 2 figs. [2 refs.]

Vipera aspis is very frequently infected as to the anterior two-thirds of its intestine with Coccidia of two species ; and [for those who do not object to venomous snakes] new-born vipers are most choice material for the experimental study of these coccidia since they can be so easily and directly infected.

A. A.

i. FRANCHINI (G.). **Sur un protozoaire d'*Euphorbia cereiformis* et sur sa culture.**—*Bull. Soc. Path. Exot.* 1923. Nov. 14. Vol. 16. No. 9. pp. 642–646. With 3 figs. [3 refs.]

ii. ——. **Inoculation de flagellés d'insectes dans le latex des Euphorbes.**—*Ibid.* pp. 646–650. [2 refs.]

iii. ——. **Sur un flagellé particulier d'une Urticacée** (*Ficus benjamina*). —*Ibid.* pp. 650–652. With 1 fig. [1 ref.]

iv. ——. **Sur un flagellé d'une Asclépiadacée** (*Arauja angustifolia*).—*Ibid.* pp. 652–655. With 2 figs.

v. ——. **Nouvelles recherches sur les protozoaires des plantes à latex.** —*Ibid.* pp. 655–659. With 3 figs. [1 ref.]

i. In the latex of an obviously sick plant of *Euphorbia cereiformis* the author found a small, round or oval, non-flagellate protozoon exhibiting amoeboid movement. He succeeded in cultivating it in latex-bouillon and thence in blood-bouillon and human-blood-agar. In all three media it developes a flagellum ; but in all three the size and form of the organism is different.

ii. The same author succeeded in infecting certain species of Euphorbias with intestinal flagellates of certain flies and Pentatomid bugs. The infected plants suffered obvious pathological changes and the introduced flagellates became leishmaniform.

iii. In the latex of 4 plants of *Ficus benjamina* the same author has found a Herpetomonas or Leptomonas-like flagellate which multiplies by not quite equal binary fission. The plants appeared healthy.

iv. In an Asclepiad plant, *Arauja angustifolia,* the same author has discovered a Herpetomonas differing from that described from plants of the same species in South America. The plant was mortally sick.

v. The author along with some further descriptions of Protozoon parasites of plants sums up the observations and conclusions of his numerous observations in this field. He emphasizes the discovery of many forms of Protozoa besides *Leptomonas davidi* in Euphorbiaceae, particularly the cactus-like Euphorbias, and he is convinced that these Protozoa are widely distributed in the vegetable kingdom, and are to be found not only in sickly plants but also in those that are healthy.

A. A.

DOGIEL (V.). [In Russian and English.] **The Transformation of the Male Pronucleus in a Spermatozoon in Certain Infusoria during their Conjugation.**—4 pp. with 1 text fig. 1923. July 8.

The process of conjugation in *Cycloposthium bipalmatum,* a ciliate inhabiting the intestine of the horse, is described and figured. The remarkable features of the process are that, in each conjugating ciliate, of the two first-formed daughter micronuclei one perishes entirely, while by the bipartition of the other are formed a " female pronucleus " and a " male pronucleus " that in all its details comes to resemble " a typical spermatozoon." The two conjugating ciliates exchange " spermatozoa," the " spermatozoon " in each case passing out through the body-wall of one conjux at a definite point, and passing in at the mouth of the other.

A. A.

DOGIEL (V.). **Cellulose als Bestandteil des Skelettes bei einigen Infusorien (Vorläufige Mitteilung).**—*Biol. Zentralblatt.* 1923. May 31. Vol. 43. No. 3. pp. 289–291.

Hitherto animal cellulose has been regarded as a peculiar property of certain Tunicates; the present author describes its discovery in the subcuticular skeletal plates first of Ophryoscolex from the stomach of *Bubalis cookei* and afterwards from other ciliates of the same family inhabiting the digestive tract of other Ungulates in Europe.

A. A.

i. RODHAIN (J.). **Trypanosome d'un Cheiroptère insectivore** *Nycteris hispida* **Schreber au Congo belge.**—*Bull. Soc. Path. Exot.* 1923. Nov. 14. Vol. 16. No. 9. pp. 659–663. With 1 fig. [7 refs.]

ii. HAUPT (Walther). **Untersuchungen ueber die Pathogenität der** *Trichomonas vaginalis.*—*Muench. Med. Woch.* 1924. Feb. 15. Vol. 71. No. 7. p. 204. [15 refs.]

iii. HOARE (Cecil A.). **A Note on the Specific Name of the Herpetomonad of the House-Fly.**—*Trans. Roy. Soc. Trop. Med. & Hyg.* 1923. Dec. 13. & 1924. Jan. 17. Vol. 17. Nos. 6 & 7. pp. 403–406. [9 refs.]

iv. MIGUEZ (Conrado). **Breve comunicación sobre un protozoario flagelado que hemos encontrado en lesiones papulosas de la piel en el hombre.**—*Rev. Inst. Bacteriolog.* 1923. Dec. Vol. 3. No. 3. pp. 95–98. With 1 fig.

v. KNOWLES (R.) & DAS GUPTA (B. M.). **A Note upon a Flagellate Protozoon found in the Saliva.**—*Indian Jl. Med. Res.* 1924. Jan. Vol. 11. No. 3. pp. 737–741. With 11 figs. [2 refs.]

i. *Trypanosoma heybergi*, the new species described by the author from a bat, is of an almost filiform attenuation at both ends, more gradually so at the anterior end, where there is no free flagellum. In the gut of 4 of 63 acarines (Leiognathus) parasitic on the bat crithidia and trypanosome forms were observed.

ii. Reviewing observations upon this subject published in Germany during the last few years, the author concludes that in all probability *Trichomonas vaginalis* is a harmless parasite present both in health and disease.

iii. After a careful survey of the recorded history of the species the author justly concludes that the correct name of the herpetomonas of the house-fly is *Herpetomonas muscarum* (Leidy) Kent.

iv. The organism figured appears to be a Bodo and therefore of doubtful significance.

v. A Bodo apparently close to *B. edax* found in the saliva in a case of spleno-medullary leucaemia, but not supposed to be in any way pathogenic.

A. A.

DYE (W. H.). **Parasitic Mites on Mosquitoes.**—*Jl. Roy. Army Med. Corps.* 1924. Feb. Vol. 42. No. 2. pp. 87–102. With 13 text figs.

When collecting mosquitoes in northern Nyasaland the author was struck with the frequency with which the females of certain species were infested by larval mites. Of hundreds of mosquitoes collected, about 50 per cent. of the females of *Mansonia uniformis*, about 45 per cent. of those of *Anopheles paludis*, and about 10 per cent. of those of

A. pharoensis during the rainy season, and about 5 and 2 per cent. respectively of those of the first two species during the cold season, were found to be thus infested. Of all the other species of the locality (2 Anopheles, 5 Culex, and *Stegomyia fasciata*) none was ever found infested, except one individual *Culex fatigans* attacked by a single mite. It is a significant fact that these mites were not once observed on a male of any species.

The author followed out the main points in the life-history of these mites and found that when removed from their mosquito host they very soon died unless they were placed in water. When placed in water, or when the dead host was placed in water, particularly during the dry season, they soon became active and ultimately attained the adult stage.

[It is clear from his excellent descriptions and figures that the author is dealing, as he supposes, with water-mites. The larvae of water-mites are well known to attach themselves to mosquitoes and other insects that pass the early stages of their existence in water. Nathan BANKS is of opinion that in doing so " they have made a serious mistake . . . . .without suspecting the suicidal result " of attachment to an insect whose future lies on land and in the air. But the facts observed by Captain Dye, namely, the exclusive choice of the female mosquito by the larval mite, and the greatly preponderant percentage of mite-infested females of particular species during the rainy season, justify the inference, in this particular case, that the mosquitoes above specified may play an important part in the seasonal dissemination of the mite.]

A. A.

LANGRISHE (J. du P.). **Mosquitoes in Bermuda.**—*Jl. Roy. Army Med. Corps.* 1924. Feb. Vol. 42. No. 2. pp. 103–120. With 9 text figs. & 1 map. [6 refs.]

A very good and useful account of the mosquitoes of Bermuda, their habits and breeding places, and the existing and prospective methods of suppressing them. Four species are present, namely *Culex fatigans, Stegomyia fasciata, Aëdes sollicitans* and *Ae. taeniorhynchus.* There are no streams or ponds in Bermuda, but there are some coastal salt marshes and brackish swamps, and these are the breeding-grounds of the last two species; while the first two species are well provided for in the rainwater stored everywhere for domestic use (which is all the water-supply of the islands), and also in " many thousands of discarded bottles, cans, etc., scattered all over " the country. *Culex fatigans* often finds still further accommodation in the cess-pits and privies of the civilian population.

A. A.

MACGREGOR (M. E.). **Malaria and** *Anopheles funestus* **in Mauritius.**—*Nature.* 1923. Dec. 29. Vol. 112. No. 2826. pp. 934–936.

To the three species of Anopheles observed in Mauritius, in 1908, by Ross, namely, *A. costalis, A. mauritianus* and *A. maculipalpis* (the last infrequently), the author now adds *A. funestus,* which, as well as *A. maculipalpis,* he found in abundance. In Mauritius the larvae of *A. funestus* when alarmed may sometimes climb up leaves that dip into the water.

A. A.

LEGENDRE (J.). **Des variations dans le trophisme des Culicides.**—*C. R. Acad. Sci.* 1924. Jan. 21. Vol. 178. No. 4. pp. 423–425. [1 ref.]

Some observations showing that the food preferences of certain species of mosquitoes are not more precise than the terms of Falstaff's honour :—

Stegomyia fasciata feeding on a cat where man is procurable. *Anopheles maculipennis* feeding on man where rabbits are available. *A. squamosus* and *pharoensis* feeding on horses where men are plentiful. *Culex pipiens* and *hortensis* coming into houses in a particular locality and biting people in the autumn of one year, and not being seen in houses in that locality in summer or autumn two years afterwards, although their larvae and pupae were still to be found in the same breeding-places of the locality. [There is nothing unfamiliar in these observations, which, however, it is perhaps necessary to record.]

A. A.

BULL (Carroll G.) & REYNOLDS (Bruce D.). **Preferential Feeding Experiments with Anopheline Mosquitoes, II.**—*Amer. Jl. Hyg.* Baltimore. 1924. Mar. Vol. 4. No. 2. pp. 109–118. With 1 fig. [3 refs.]

The experiments here described in detail are a continuation and completion of those already summarized in this *Bulletin* (Vol. 21, pp. 143-4) ; they were carried out in conformity with that first series of experiments and with the same species of Anopheles—*A. quadrimaculatus*. The insects were bred from pupae and large larvae collected on a great scale. The animals used for bait were man, horse, cow, dog, pig, sheep, goat, cat, rabbit, fowl. The conclusions are (for the stock of *A. quadrimaculatus* used) that although man cannot be wholly protected, assaults upon him may be greatly abated by the immediate presence of domestic animals, and therefore that in places where malaria is just upheld it would be quite possible to break the parasite-cycle by increasing the number of domestic animals—particularly horses, cows, and dogs—in proximity to human domiciles, especially at night ; that as regards the horse and the cow (which were observed, generally in that order, to be the most alluring animals) and also as regards man (who came next) the mosquitoes showed decided preferences for individuals ; and that the insects would scarcely touch fowls and rabbits even when there was no other bait.

A. A.

BARBER (M. A.) & HAYNE (T. B.). **Some Notes on the Relation of Domestic Animals to Anopheles.**—*Public Health Rep.* 1924. Jan. 25. Vol. 39. No. 4. pp. 139–144. [3 refs.]

Some interesting experiments made at different seasons of the year, in Arkansas and Georgia, to ascertain the food predilections of *Anopheles quadrimaculatus* and *crucians* are here described in detail. Pigs and men and pigs and rabbits were exposed to attack at the same times and under identical conditions. The experiments reveal that these two species of Anopheles " show no special predilection for domestic animals over men when such factors as size and amount of exposure are excluded," and " little evidence that the Anopheles . . . have become zoophilic in the sense of Roubaud."

A. A.

BARBER (M. A.) & HAYNE (T. B.). **Some Observations on the Dispersal of Adult Anopheles.**—*Public Health Rep.* 1924. Feb. 1. Vol. 39. No. 5. pp. 195–203. [4 refs.]

ROUBAUD concluded from his observation of *A. maculipennis* that the population of an Anopheles resting-place is quickly renewed. The authors have confirmed this conclusion by observation of *A. quadrimaculatus* and *crucians.* In experiments here described in detail they stained (by spraying with eosin or with methylene blue) the Anopheles crowded in particular shelters, and examined catches made at random in those shelters at intervals during the next few days: they found that on the sixth day after the staining operation the catch did not contain any stained individuals—or perhaps 1 in a catch of 1,156 insects. Replacement of the population was practically as brisk and complete in shelters that afforded a blood-feed as in those that did not. Very very few stained Anopheles were ever found again elsewhere in the vicinity. Anopheles (*quadrimaculatus*) kept trapped in a large resting-place of their own choice suffered a very high mortality, even when the place contained an animal suitable for food—about six days was the limit of their existence. Observations were made on the power of flight of Anopheles: hundreds of individuals were found in a barn about a mile distant from the nearest water, but beyond that distance the numbers found were very small. [From all these observations it must be inferred that the adult life of *A. quadrimaculatus* and *crucians* in the summer season is very brief] and, as the authors imply, that the harmful powers of these two species, in the area of observation, are much limited.

A. A.

BARBER (M. A.), KOMP (W. H. W.) & HAYNE (T. B.). **Some Observations on the Winter Activities of Anopheles in Southern United States.**—*Public Health Rep.* 1924. Feb. 8. Vol. 39. No. 6. pp. 231–246. [5 refs.]

Anopheles crucians, punctipennis and *quadrimaculatus,* in the southern parts of Georgia, Alabama, and Louisiana, may continue in full sexual activity in winter, though the development of ova, larva, and pupa is retarded; therefore any winter attack on them must include the larva as well as the adult. The adults are widely dispersed in winter, not concentrated; therefore they must be attracted to their destruction, though traps baited with pigs do not hold out much hope of success.

A. A.

BONNE (C.). **Remarques sur les** *Cellia* **sud-américaines.**—*Bull. Soc. Path. Exot.* 1924. Feb. 13. Vol. 17. No. 2. pp. 132–137. With 1 fig. [3 refs.]

The interdistinctive features of *Anopheles* (*Cellia*) *argyrotarsis* and *tarsimaculatus* are by no means conspicuous, and numerous intermediate forms have from time to time been described as new species. The author thinks that the recognition of some of these intermediate forms or varieties may be something more than a matter of taxonomic importance, since in Dutch Guiana he has observed that the Anopheles which enters houses and attacks man on the coast is a variety of *tarsimaculatus,* whereas the typical *tarsimaculatus* found up country restricts its attention to cattlesheds and never goes into houses. [Recent papers (see *e.g.*, this *Bulletin*, Vol. 21, p. 143) seem to indicate that too much is being made of these supposed exclusive preferences of Anopheles.]

A. A.

RODENWALDT (Ernst). **Entomological Notes No. II.**—*Meded. Burgerlijk. Geneesk. Dienst in Nederl.-Indië.* 1923. Part 3. pp. 299–304. With 1 map. [1 ref.]

In these notes the local distribution of *A. ludlowi, rossi, aconitus, fulginosus* and *annulipes* is mapped and recorded. Reasons are given for suspecting *A. maculatus*, which has hitherto been supposed to be harmless in the Dutch East Indies, to be a dangerous carrier of malaria in the island of Alor [off Timor]. A larva monstrosity of *A. fulginosus* with two pairs of fans on the individual abdominal segments and thorax is described. MAHULETE's observation that brown larvae of *A. barbirostris* become males, and black or dark larvae females, is confirmed. *A. barbirostris* was observed to be very much a house-haunting species in several of the large islands around Timor.

A. A.

VIALATTE (Ch.). **Contribution à la recherche de l'aire de dispersion de** *Stegomyia fasciata.* **Son existence à Marrakech.**—*Arch. Inst. Pasteur d'Algérie.* 1923. Dec. Vol. 1. No. 4. pp. 688–690. With 1 text fig. [1 ref.]

Records the existence of *Stegomyia fasciata* in Marakesh (Morocco). This city is about 100 miles from the coast with arid country intervening. In 1922 the rainfall was barely 15¼ inches, spread over 55 days, and the minimum thermometer readings (February) were 1° C.

A. A.

ANTONIBON (Arrigo). **Azione del petrolio sulle larve di zanzara.** [The Action of Petroleum on Mosquito Larvae].—*Ann. d'Igiene.* 1923. Nov. Vol. 33. No. 11. pp. 796–801. With 1 fig. [4 refs.]

The author carried out an interesting series of experiments to test the following three points relative to the lethal effects of petroleum on mosquito larvae.

1. The mechanical action of the layer of oil preventing the larvae from obtaining access to the air. This he shows to be of little moment, since the water contains sufficient oxygen to preserve their life for several hours. Those of *Culex pipiens* lived for 8 hours in a stoppered bottle filled with water.
2. Obstruction of the respiratory syphon. By coloration with Sudan III or Scharlach Red it was shown that contact of the syphon with the oil led to immediate blocking of the respiratory apparatus, the oil entering by capillary attraction and the larva dying from suffocation within 30–60 minutes.
3. The toxic effects of the petroleum. This was not easy to determine, because the toxic and suffocative actions could not be separated, but immersion in the oil killed the larvae in 5 minutes.

H. Harold Scott.

GREEN (Howard Whipple). **The Effect of Oil upon** *Anopheles* **Mosquito Larvae.**—*Amer. Jl. Hyg.* Baltimore. 1924. Jan. Vol. 4. No. 1. pp. 12–22.

Experiments with many kinds of oil are here tabulated, but they do not disclose anything new. They show that although larvae can be suffocated by oil, whether by mere interposition of a film of oil or by entry of oil through the spiracles, the rapidity of death depends upon the toxicity and volatility of the oil.

A. A.

HURWOOD (Alan S.). **Some Observations on the Use of Oil as a Larvicide.**—*Health.* Melbourne. 1923. Nov. Vol. 1. No. 9. pp. 255–259. With 2 charts in text.

In the hot dry climate of Australia a mixture of 70 parts of kerosene and 30 parts of residual (fuel) oil makes the best spray; about 1 oz. to the square yard should be sufficient.

A. A.

BUXTON (P. A.). **Applied Entomology of Palestine, being a Report to the Palestine Government.**—*Bull. Entom. Res.* 1924. Mar. Vol. 14. Pt. 3. pp. 289–340. With 5 plates, 9 text figs. & 1 map. [47 refs.]

This is a replete and mature paper with an introduction to the topography and climate and faunal features of Palestine, a map, and a full list of references. Of 36 pages devoted to medical entomology more than half are occupied by the anopheline mosquitoes, the remainder being filled with usefully annotated lists of other land-arthropods found in the country.

The local species of Anopheles number nine, of which two—*A. pharoensis* and *mauritianus*—are rare. Of the others, *A. bifurcatus* is an urban or "domestic" species, breeding most commonly, but not exclusively, in wells and in subterranean cisterns, and is by far the most dangerous of all as a malaria-carrier; while the remaining six—*A. algeriensis*, *A.* "*hyrcanus*" [=*sinensis*], *A. elutus* [which the author separates from *A. maculipennis*], *A. sergenti* [which he regards as distinct from *culicifacies*], *A. superpictus* [popularly called "palestinensis"], and *A. multicolor*—are rural. Of these rustic species the first two—*algeriensis* and "*hyrcanus*"—have never been seen in house or tent by the author, and are therefore considered by him to be of little importance; all the other four species go into houses and may rest there after feeding on man. The breeding-places of these species are described, and the observed associations of the species therein. In discussing the subject of artificial control the destruction of *A. bifurcatus* is written down a "gigantic" business and the greatest sanitary problem of Palestine. For destroying weeds and grass in irrigation channels, where some of the other species breed, flame-throwers were tried, but did not give satisfaction. In the laboratory, experiments were made with trioxymethylene as a larvicide, but were only moderately successful: using it in the proportion of 3 gm. to the square metre, two-thirds of the exposed larvae died, but one-third survived and eventually pupated. The discussion of natural control is mostly of only local interest, but the author remarks on the usefulness of fishes of the genus *Cyprinodon* in the field and of the possible utility of the common eel, and also on the disputable efficacy of, at any rate, the local species of Chara. He and others have found 4 species of Anopheles larvae flourishing in pools containing great masses of Chara, but, on the other hand, observed two pools that remained quite free from mosquito larvae until Chara was cut and then became occupied by larvae of Theobaldia.

There are some interesting remarks on the influence of periodic religious pilgrimages and of the nomadic Bedouin life on the problems of malaria. In the author's experience the quartan parasite is rare in Palestine, having been found only in just over 1 per cent. of his films.

Stegomyia fasciata occurs in the towns of the coast and of the Jordan rift; in Jerusalem also, but there only in summer. Two cases of myiasis by *Wohlfahrtia magnifica* are mentioned. In the author's experience the maggots of *Chrysomyia albiceps* are not so exclusively predaceous on Lucilia and Calliphora maggots as they have been said to be.

Xenopsylla cheopis was found to be the common rat flea, but *Ceratophyllus fasciatus* was observed once in Jerusalem. *Pulex irritans* was identified. *Cimex lectularius* is found in many parts of Palestine, even in Tiberias where the mean temperature is high. *Pediculus humanus* is common.

A. A.

WHITTINGHAM (Harold E.) & ROOK (Alan F.). **Observations on the Life-History and Bionomics of** *Phlebotomus papatasii*. [Abstract.] —*Brit. Med. Jl.* 1923. Dec. 15. pp. 1144–1151. With 14 figs. [14 refs.]

The R.A.F. Sandfly Fever Commission having recently demonstrated that this fever can be given to man in England by the bite of sandflies (*Phlebotomus papatasii*) bred in sterile soil in England, and having thereby shown that the virus of the fever must either be actually inherent in the egg or become in some way adherent to the egg (or larva) from an original parental source, it became the business of the authors, as members of the said Commission, to follow all the natural operations of *P. papatasii* with an eye to rational and effective control and prophylaxis. In the result they have given us one of the completest and intensest accounts of the life-history of a specific insect that has ever been published. They appear to have lived with the insects and to have kept a devoted eye upon them from cradle to grave—from ovum, full cycle, to ovum again; and, perhaps, we can appreciate what this means when we learn that certain natural events in the life-history occur only between midnight and dawn and certain crises require the proper concurrence of temperature and moisture. To attempt to summarize such a document is an injustice; it must be read in original; and the original, though full of minute detail, is not in the least tedious. Nevertheless, we may extract certain facts that most plainly illustrate the utility to a sanitarian of a minutely particular entomological study.

The complete life-cycle of *Phlebotomus papatasii* (as studied in Malta, where all field observations were checked by experiment) occupies, *in summer*, when temperature and humidity are throughout propitious, about 8 weeks. The optimum atmospheric temperature for all stages of the cycle is between 80° and 90° F. When the mean daily temperature falls below 65° F. the adults very soon die: the insect therefore subsists during winter not as an adult but, as is here demonstrated, as a larva.

The egg-stage lasts 9 or 10 days. There are four stages in the growth of the larva; the first three last each about 6 days; the fourth lasts in summer about 9 days, but when the earth-temperature falls below 65° F. a check occurs, which may continue for at least 202 days, and it is in this stage that the insect hibernates. The pupa stage lasts about 10 days. The adult stage lasts about 14 days in a moist atmosphere, but in a comparatively dry atmosphere (40 to 50 per cent. humidity) adults may live as long as 30 days.

To give a few more particulars of interest to the medical officer:—

The act of generation usually does not occur until the 2nd day of life and until the female has had a feed of blood; a single act is sufficient. The term of ovarian pregnancy is 7 to 10 days; the one feed of blood is essential to pregnancy, further feeds—though they may be taken—are not essential. Parturition extends over 2 or 3 days and the female dies a day or two afterwards. The full tale of eggs is about 40, but rarely are all delivered—on an average (observation of thousands of flies) about 5, and of those laid less than half "reach maturity." Parturition does not take place unless atmospheric humidity is over 65 per cent. The favourite place for depositing eggs is at the foot of walls and buildings, where there is nitrogenous matter and moderate moisture. The egg, except when perfectly fresh laid, will stand drying for about an hour; it will stand submersion for 24 hours, but embryonic development is then delayed.

The larva usually hatches between midnight and dawn. A humid atmosphere (optimum 80-90 per cent. humidity) is necessary for successful hatching. At its very earliest appearance drying is fatal, but older larvae, particularly those in the 4th stage, are more resistant to drought. Larvae cannot resist complete submersion long, but can tolerate partial submersion (as in rainy weather) for at least 3 days. The pupa cannot withstand complete submersion longer than an hour; but it may be dried in the air for weeks without losing its vitality.

Adults usually emerge between midnight and dawn. They have the characteristic Psychodid hopping flight and do not go more than about four yards at a stretch; during the whole of their brief life they probably do not travel fifty yards from the place where they were bred. Although the parturient female requires a certain degree of atmospheric humidity, adults dislike damp and instinctively avoid a skin wet with perspiration.

The paper is well illustrated with enlarged drawings of the egg in various aspects, including the act of hatching, the larva in all its four stages, the pupa, the egress of the imago, and the adult male and female.

It is only just to say, in conclusion, that quite apart from its purely entomological interest and its practical value to the sanitarian, this exact record of the life-history of a species as particularly affected by its meteorological environment has a high value for the biologist.

A. A.

NITZULESCU (Virgil). **Sur l'ingestion du bleu de méthylène par** *Stomoxys calcitrans.*—*C. R. Soc. Biol.* 1924. Jan. 25. Vol. 90. No. 2. pp. 155–156. [1 ref.]

A confirmation of the fact that Stomoxys sucks other liquids besides blood. Having noticed the numbers of these blood-sucking flies dead near a dish of sweetened arsenical solution, the author made assurance doubly sure by using a sweetened solution of methylene blue which was plainly visible in the insects' crop. The author observed that 30 per cent. of the flies in chemists' shops at Jassy were Stomoxys.

A. A.

JACK (Rupert W.). **Tsetse Fly. Inspection of Shangani Experimental Area.**—*Rhodesia Agric. Jl.* 1923. Dec. Vol. 20. No. 6. pp. 653–662.

In continuation of observations already reported (see this *Bulletin, ante,* p. 149), the author in August 1923 made another inspection, of four weeks' duration, of the fly tract in the Shangani basin in which game has been harried since 1919. His impressions, which are supported by a certain amount of native testimony and by the opinion of some independent European observers, remain unshaken that " there has been very marked diminution, and, as far as can be ascertained, considerable retrogression of the fly " and leave no reasonable doubt that this has been brought about by harrying and destruction of the game. In some parts of the tract in question, where the fly (*Glossina morsitans*) was very abundant, it is now almost extinct, and these are just the parts where the shooting has been most effectively carried out. At the same time the fly has been spreading in other parts of the colony outside the tract in question.

A. A.

JOURNAL OF THE DEPARTMENT OF AGRICULTURE. Pretoria. 1923. Nov. Vol. 7. No. 5. p. 389. With 1 fig.—**Dummy versus Zebra to attract Tsetse Flies.**

In the Journal above cited, for July 1923, Mr. R. H. HARRIS recorded some experiments showing that tsetse flies are attracted to dummy animals, even of rude make, as readily as to living animals, and he here records some further experiments, which confirm him in his explanation that tsetse flies are led to their prey by sight rather than by smell. When a dummy animal was placed beside an ox the majority of flies always went to the ox ; but when a tame zebra took the place of the ox (the zebra's alternating dark and light stripes making it a relatively inconspicuous object) the majority of flies always went to the dummy.

Dummy and zebra used to test comparative attractiveness for tsetse flies.

A. A.

NICHOLLS (Albert G.). **Two Cases of Infestation of the Intestine with Larvae of Species of Fannia.**—*Canadian Med. Assoc. Jl.* 1924. Jan. Vol. 14. No. 1. pp. 42–43.

The larvae in question were *Fannia scalaris* and *F. canicularis*—both together in one of the cases. As the patient in one case is said to have passed them " about once a month," and in the other case " off and on for fifteen years," it is a reasonable conjecture that they got into the faeces after defaecation, not before.

A. A.

COLOMBE (J.) & FOULKES (D.). **Myiases du tube digestif.**—*Gaz. des Hôpit.* 1924. Jan. 1. & 3. Vol. 97. No. 1. p. 5.

Two cases of intestinal myiasis in adult women are rather fully reported. Symptoms common to both were anorexia, fits of acute abdominal pain, tenderness on pressure, and attacks of vomiting, at times sanguinolent; the recurrence of these symptoms continued for a long time, in one case for at least 16 months. In one case, where the maggots identified were *Piophila casei*, there also occurred violent headache and an attack of haematuria, and maggots were sometimes vomited: this case resisted all treatment and the patient refused to have the stomach washed out. In the other case, where the maggots were identified as a species of Anthomyia, there was persistent diarrhoea and maggots were passed and sometimes blood, and a 2·7 per cent. eosinophilia was observed: in this case maggots disappeared from the stools after treatment with santonine, but although the patient's other symptoms gradually improved thereafter, she seems not to have recovered health completely.

A. A.

GILMER (Paul M.). **The Poison and Poison Apparatus of the White-marked Tussock Moth, *Hemerocampa leucostigma* Smith and Abbot.** —*Jl. Parasit.* 1923. Dec. Vol. 10. No. 2. pp. 80–86. With 4 text figs. & 2 plates. [8 refs.]

The irritation caused by certain smaller white hairs of the caterpillar of this species of tussock-moth is not a mechanical effect, but is due to a venom secreted by unicellular glands individually connected with each hair. These hairs, though occurring in small tufts all over the body, are particularly aggregated in certain tubercles and tussocks. The hairs retain their virulence when shed in cocoons and moulted skins. The venom is very resistant to certain chemical agents and to heat, and is extremely insoluble in all solvents tried; it is here stated that its properties are only temporarily lost by exposure to alkalis and by extreme heat (185° C. dry heat for an hour; 105° steam for 15 minutes); nothing short of complete destruction of the protoplasm of the unicellular gland destroys the urticating properties of the hair.

A. A.

EWING (H. E.). **Our Only Common North American Chigger, its Distribution and Nomenclature.**—*Jl. Agric. Res.* Washington. 1923. Dec. 1. Vol. 26. No. 9. pp. 401–403. [5 refs.]

The animal referred to no less than fifteen times in this short paper by the name of " chigger " is not the notorious sand-flea (variously known as *Sarcopsylla, Dermatophilus* and *Tunga penetrans*) but a Trombidiid mite—a Trombicula. [This ascription of the name "chigger" to a mite was long ago stigmatized as improper, and is particularly unfortunate in medical zoology.]

A. A.

CAWSTON (F. G.). **Some Practical Means of dealing with the Menace of Fresh-Water Snails in Natal.**—*S. African Med. Rec.* 1923. Nov. 24. Vol. 21. No. 22. pp. 514–515.

The menace of freshwater snails is, of course, implied in the fact that some of the species are known to be, and other might hereafter prove to be, intermediary hosts of trematode parasites hurtful to man. This menace is enhanced by embankments and by anything that, by obstructing natural drainage, tends to the formation of shallows, swamps and of unnecessary ponds attractive both to pond-snails and to bathers. The author regards the duck as a very present and profitable help against this menace, and thinks that assistance may be rendered by the school teacher, and also by the posting of instructive warnings at seductive ponds. This matter, he thinks, well deserves the attention of the Railway Administration and of the Departments of Public Health and Education.

A. A.

GILMER (Paul M.). **Derris as a Parasiticide.**—*Nineteenth Report State Entomologist of Minnesota.* 1922. Dec. 1. pp. 41–49. [3 refs.]

Derris (or Deguelia) may be used either as a dry powder or as a liquid extract. Trials here described show that, like pyrethrum, it is a useful insecticide. Its action is not so instantaneous as that of pyrethrum, but its virtue in the open air is more persistent. As it is to some extent toxic to vertebrates as well as to insects, having in some of these trials killed rats as well as their ectoparasites and made a cat as well as its fleas uncomfortable, it is well to mix it with a milder insecticide, and a powder consisting of 20 per cent. derris and 80 per cent. tobacco is here recommended for ordinary use.

A. A.

RAM (Beli). **Two Fatal Cases of Snake Bite.**—*Indian Med. Gaz.* 1923. Dec. Vol. 58. No. 12. pp. 585–586.

Although identification was not possible, the snake in these two cases, of which two brothers were the victims, is believed, from the symptoms, to have been a krait. The assault occurred in the early hours of the morning while the brothers, aged 25 and 12 years, were sleeping together on the ground. The elder brother was bitten on the shoulder and did not go for treatment until about three hours afterwards when the presence of a snake was suddenly discovered. The account is not quite clear, but one gathers that the man was asleep when he was bitten, that he was awakened by some tingling which he ascribed to an insect-bite, and that he went to sleep again. He was able to walk to hospital (there being then no paralysis of the limbs), where he complained of inability to swallow, obscurity of vision, and pain in chest and hypogastrium; slight ptosis and slight incoherence were noticed, and on the shoulder a small purple spot with no oozing and no swelling.

Fresh cobra antivenene (40 cc.) was then injected intravenously, and as further signs of paralysis appeared another similar dose was injected an hour afterwards. The paralysis progressed, however, and two hours afterwards the patient lay quite paralysed and helpless, but still conscious and able to whisper and make some signs. Two hours later he could still attempt to put out his tongue, but his eyelids were closed, and he could no longer make signs with his hand. As the pulse was good and as no difficulty of breathing was observed, but only occasional twitchings of the body, the patient was left for a while, and half an hour afterwards—that is about 8½ hours after he was bitten—he was dead.

The younger patient made no complaint of any kind until his brother was getting his first injection, nor, although it was reported that he had complained of tingling behind the ear, was any mark found upon him. His symptoms when they appeared were attributed to fright; except that he retained the power of speech until near the end, and regained the power of swallowing which at the beginning was impaired, they were like those exhibited by his brother; and he died about 6½ hours after their first onset.

A. A.

METCALFE (A. J.). **Two Deaths from eating "Toad Fish."**—*Med. Jl. Australia.* 1923. Dec. 1. 10th Year. Vol. 2. No. 22. pp. 571–572.

Two Malays, although duly warned of the risk, ate the flesh of a species of globe-fish (Tetrodon) at their midday meal. No ill effects followed immediately, and at half-past five in the evening they ate the partly cooked liver of the fish. One man died half-an-hour afterwards; the other man, who then received an emetic, died three hours later. The symptoms, which were manifested in a few minutes and developed very quickly, were motor and sensory paralysis, beginning in the hands and spreading upwards to the throat, and then involving the legs and spreading upwards in the same way. [The Tetrodon of this tragedy, here called a " toad fish," is everywhere known as a globe-fish, and sometimes as a parrot-fish. The toad fishes belong to another family (Batrachidae) of another order of fishes (Plectognathi) and have a poisonous reputation of their own].

i. THEODOR (Oscar). **Pupae of Some Palestinian Culicines.**—*Bull. Entom. Res.* 1924. Mar. Vol. 14. Pt. 3. pp. 341–345. With 3 text figs.

ii. CHARRIER (H.). **Le** *Stegomyia fasciata* **dans la région de Tanger (Maroc).**—*Bull. Soc. Path. Exot.* 1924. Feb. 13. Vol. 17. No. 2. pp. 137–142. [9 refs.]

iii. NEWSTEAD (R.). **On a New Species of** *Phlebotomus* **from Japan.**—*Ann. Trop. Med. & Parasit.* 1923. Dec. 21. Vol. 17. No. 4. pp. 531–532. With 1 text fig.

iv. FOLEY (H.) & PICOUT-LAFOREST (A.). **Quelques observations sur la répartition et la biologie d'***Holoconops mediterraneus* **(Cératopogoninés) dans les régions sahariennes.**—*Arch. Inst. Pasteur d'Algérie.* 1923. Dec. Vol. 1. No. 4. pp. 684–687. [3 refs.]

v. EDWARDS (F. W.). **On some Algerian Species of Simulium.**—*Arch. Inst. Pasteur d'Algérie.* 1923. Dec. Vol. 1. No. 4. pp. 647–653. With 2 text figs.

vi. BLACKLOCK (D.). **A Note on** *Auchmeromyia luteola,* **Fab.** [Miscellanea.]—*Ann. Trop. Med. & Parasit.* 1923. Dec. 21. Vol. 17. No. 4. p. 555. With 1 fig.

vii. PAVLOVSKY (E. N.). & STEIN (A. K.). **Die Gastrophilus-Larve als Gastparasit in der Menshenhaut.**—*Parasitology.* 1924. Jan. Vol. 16. No. 1. pp. 32–43. With 5 text figs. [1 ref.]

viii. LEON (N.). **Sur l'appareil buccal de la punaise des lits** (*Cimex lectularius*).—*Ann. Parasit. Humaine et Comparée.* Paris. 1924. Jan. Vol. 2. No. 1. pp. 71–73. With 2 figs. [4 refs.]

ix. CAPPE DE BAILLON (P.). **Mycose des centres nerveux chez le grillon domestique** (*Gryllus domesticus* **L.**).—*Ann. Parasit. Humaine et Comparée.* Paris. 1924. Jan. Vol. 2. No. 1. pp. 26–33. With 2 figs. [8 refs.]

x. WESTPHALEN (H.). **Milben in den Fäzes des Menschen.**—*Deut. Med. Woch.* 1924. Feb. 8. Vol. 50. No. 6. pp. 175–176. [4 refs.]

xi. WALSH (David). **Insect Bites and Stings.**—*Jl. Trop. Med. & Hyg.* 1924. Feb. 1. Vol. 27. No 3. pp. 25-26.

i. Contains figures of paddles and breathing-trumpets and a key for identification of species.

ii. This paper draws attention to some particular gaps in the chart showing the geographical distribution of *Stegomyia fasciata* published in BRUMPT'S Précis.

iii. *P. squamirostris* described and figured.

iv. Records finding microfilariae in two of fifty of this species caught on 10 asses of which 3 had the same kind of microfilaria in their blood.

v. *S. ornatum, S. bezzii, S. aureum, S. beckeri, S. equinum,* and *S. sergenti* n. sp., of which the male is " similar in most respects to " and the female is " apparently indistinguishable from " *S. equinum.*

vi. A photograph shows the attitude, almost at right angles to the skin, assumed by the larva when sucking blood.

vii. There is not much that is novel in this paper except a good figure of a vertical section of the skin showing that the track of the Gastrophilus larva is in the skin, just below the stratum lucidum, and not, like that of Hypoderma, beneath the skin.

viii. Confirms the fact, which some authors have questioned, that the apposed mandibles of the bug form a double canal.

ix. An account of a fungus invading and disorganizing the cerebral ganglia of the common cricket by way of the gullet. The fungus is not identified, but its mycelium and spores are figured.

x. Mites are occasionally found in human faeces, particularly in diarrhoeic conditions. They are ingested with food. In the author's experience they have usually been traced to flour, and have been determined as *Tyroglyphus farinae,* and have had no pathological significance.

xi. Emphasizes the possibility of infection from insect bites and refers to well-known principles of treatment.

A. A.

PAWLOWSKY (E.) & STEIN (A. K.). **Sur les causes de l'action des insectes du genre** *Pediculus* **sur le derme de l'homme.**—*Bull. Soc. Path. Exot.* 1924. Feb. 13. Vol. 17. No. 2. pp. 143–144. With 1 fig. [2 refs.]

The toxic properties of the saliva of Pediculus, as of Phthirius, come from the reniform salivary glands. The secretion leaves in the case of Pediculus an itching papule ; in the case of Phthirius painless blue spots.

A. A.

PLAGUE.

TAYLOR (J.) & CHITRE (G. D.). **Comparative Experiments on the Transmission of Plague by *X. cheopis* and *X. astia* with a Discussion of Certain Epidemiological Evidence as to the Relation of these Fleas to Epidemic Plague.**—*Indian Jl. Med. Res.* 1923. Oct. Vol. 11. No. 2. pp. 621–638. [5 refs.]

A series of plague transmission experiments were carried out with Madras rats in Bombay during the cold weather. Out of eleven experiments in which *X. astia* was used a successful transmission occurred in three, while under exactly the same conditions four out of eleven with *X. cheopis* were successful.

Similar experiments with guineapigs showed six successes out of eight with *cheopis*, and only one out of eight with *astia*. The failure of *astia* to transmit plague in Colombo along with these results in Bombay are considered in relation to certain facts as to the distribution of *astia* and the occurrence of plague in Central and Northern India, and would suggest that where this flea is found under suitable climatic conditions it may be an effective carrier.

The view is put forward that the presence of *astia* as the sole flea on rats in certain areas of the Madras Presidency is not so much an indication of special suitability of the climate for *astia* as an indication of unsuitability for other fleas. The low total prevalence of *astia* suggests that the climatic conditions are not specially favourable even for this flea. A short series of biting tests with *astia* on the human host were made. 72 per cent. of successful bites were obtained within 2 minutes on a single application of each flea used at a temperature between 76°F. and 84°F. A method of identifying the species in the living state is given in an Appendix.

J. H. Tull Walsh.

OTTEN (L.). [In Dutch. Title only in English.] **The Way in which Plague spreads over Java (Over de wijze van verspreiding der pest op Java).**—*Geneesk. Tijdschr. v. Nederl.-Indië.* 1923. Vol. 63. No. 6. pp. 970–990. With 3 folding maps. [1 ref.]

Otten gives his view on the spread of plague from village to village, which is opposed to that of VAN STEENIS (see this *Bulletin*, Vol. 20, p. 741). Active transmission by the non-migrating house rat is not possible. Of the two remaining possibilities (transmission by the field rat, after it has been infected by contact with the house rat, and by minor transport of infected house rats or fleas) VAN STEENIS attaches most value to the first, and especially to the flea *Pygiopsylla ahalae*, common on the field rat, at least in cooler climates. Otten offers argument, which cannot be followed in detail, to show that the contact existing between the two species of rats is not in agreement with this statement; he denies that VAN STEENIS has established the part played by the field rat in plague spread. He holds that "infection is carried everywhere by human agency by means of the smallest load and along the narrowest line of communication." [v. HOESEN, this *Bulletin*, Vol. 20, p. 361.]

W. J. Bais.

HEGGS (T. Barrett). **Some Observations on Plague in Baghdad, with a Plea for the Routine Use of the Specific Antitoxic Serum in Treatment.**—*Jl. Trop. Med. & Hyg.* 1923. Nov. 1. Vol. 26. No. 21. pp. 325–328.

The author records some very sound and useful deductions founded upon outbreaks of plague during 1922 and 1923 :—

" (1) Bubonic plague is endemic in Baghdad. In the inter-epidemic periods plague infected rats are continuously found, though in small numbers.

" (2) Climatic conditions determine the onset and cessation of the disease in epidemic form. A mean weekly maximum temperature above 100°F. and a weekly minimum temperature below 40°F. in Baghdad are inimical to plague.

" (3) The protection of the population by anti-plague vaccine is definite and almost complete.

" (4) There is evidence to show that some protection may last longer even than one year.

" (5) The best method of treatment is by anti-plague serum (Pasteur), the results of which completely justify full confidence. . . . . . Large doses by the intravenous route in the toxic cases are required . . . . . as soon as possible. Doses of less than 40 cc. are useless. 100 cc. [to 250 cc.] . . . . . is required in very toxic cases. An initial large dose gives better results than a moderate dose repeated. The myocarditis of plague toxaemia is severe and dangerous and must always be considered."

J. H. T. W.

BERNARD (P. Noël) & PONS (R.). **Recherches sur les formes anormales de la peste au Cambodge et en Cochinchine.**—*Bull. Soc. Path. Exot.* 1924. Jan. 9. Vol. 17. No. 1. pp. 39–61. (Discussion pp. 61–67.)

May we say at once that variation is a law of life and that abnormal forms of most pathogenic bacteria are accepted. The authors tell us that every year in Cochinchina a few sporadic cases of plague occur, which are sometimes the starting points of small local epidemics quickly suppressed by classical methods.

In Cambodia plague is endemic at Phnom-Penh, causing every month a few deaths and nearly every year provoking an epidemic. It was among these plague cases that the authors, accompanying the Health Officers, carried out their micro-biological investigations. 105 specimens of liver were taken by aseptic puncture. The bacilli isolated were inoculated into rats or guineapigs and were also tested as to their reaction when grown with various sugars. Fifteen "observations" are given in lengthy detail. All the strains fermented glucose and maltose, generally without gas, sometimes with gas. Fermentation of mannite occurred rarely and of lactose and saccharose only once (Obs. 154) in the 12 hour period and once or twice after 24 hours. In these cases inoculation was negative for plague; Obs. 154 :—Diagnosis : paracoli bacillus or Friedländer ! Obs. 202. Diagnosis :—This germ has the cultural and biochemical reactions of paratyphoid B, but did not agglutinate with Anti-para B serum.

Contrary to the opinion of MATHIS* [see this *Bulletin*, Vol. 20, p. 362] the authors state that :—Neither at Saigon and Cholon, nor during our month's work at Phnom-Penh at the endemic period, were we able to confirm the existence of unrecognised septicaemic plague in infants holding any special place in infant mortality.

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* Of 398 cases of plague recorded in 1921, 168 were in children under ten and 12 in infants of 5 to 25 days. Diagnosis was made post mortem from the examination of pieces of liver or spleen. Convulsions or intestinal haemorrhage were the alleged causes of death. Buboes were rare.

J. H. T. W.

PUBLIC HEALTH REPORTS. 1924. Feb. 1. Vol. 39. No. 5. p. 204. **—Record of Plague Infection in California.**

The following table, taken from a report recently received from Senior Surgeon J. C. PERRY, Director, Public Health, District No. 7, is of historical interest :—

Record of Plague Infection.

Place.	Date of last case of human plague.	Date of last case of rat plague.	Date of last case of squirrel plague.	Total number rodents found infected since May, 1907.
City :				
San Francisco ..	Aug. 18, 1923.	Oct. 23, 1908	May 21, 1917.	398 rats, 1 squirrel.
Oakland	Sept 10, 1919	Dec. 1, 1908.	Sept. 4, 1919.	126 rats, 3 squirrels.
Berkeley	Aug 28, 1907	None.	None	None.
Los Angeles.. ..	Aug 11, 1908.	None.	Aug. 21, 1908.	1 squirrel.
Santa Cruz	None.	None.	May 5, 1920.	2 squirrels.
County :				
Alameda (exclusive of Oakland and Berkeley.)	June 29, 1922.	Oct. 17, 1909. woodrat.	July 8, 1922.	466 squirrels, 1 woodrat, 3 plague-like squirrels.
Contra Costa ..	July 13, 1915.	None.	June 6, 1923.	1,752 squirrels.
Fresno	None.	None.	Oct. 27, 1911.	1 squirrel.
Merced .. .	None.	None.	May 15, 1920.	8 squirrels.
Monterey	None.	None.	June 16, 1920.	41 squirrels. 1 plague-like squirrel.
San Benito	June 8, 1921.	None.	May 26, 1921.	102 squirrels. 1 plague-like squirrel.
Santa Clara ..	Aug. 31, 1910.	None.	June 29, 1920.	44 squirrels.
San Joaquin ..	Sept. 18, 1911.	None.	May 17, 1920.	22 squirrels.
San Luis Obispo ..	None.	None.	Jan. 29, 1910.	1 squirrel.
Santa Cruz ..	July 18, 1922.	None.	Sept. 27, 1922.	40 squirrels.
Stanislaus	None.	None.	June 18, 1920.	15 squirrels.
San Mateo ..	None.	None.	June 23, 1920.	22 squirrels.

It shows that the last case of human plague in California occurred on August 18th 1923, and the last recorded case of squirrel plague on June 6th 1923. Inspection and poisoning of ground squirrels (*Citellus beecheyi*) are being carried out in several counties of the San Francisco Bay District.

J. H. T. W.

TANON (L.). **Le laboratoire de prophylaxie de la peste à la Préfecture de Police.**—*Ann. d' Hygiène Publique, Industrielle et Sociale.* 1923. Oct. New Series. No. 10. pp. 606–617. With 6 figs.

This police laboratory watches over Paris and carries out excellent work in plague prevention. The methods for catching rats in buildings, wharves, etc., are fully described. Directions for the use of phosphorus paste, as the most useful poison for rats, are printed and distributed with supplies of the paste.

J. H. T. W.

WASILEWSKI (A.). **Dane doświadczalne w kwestji zapobiegania i leczenia dzumy. Les données expérimentales sur la prévention et le thérapie de la peste.**—*Medycyna Doświadczalna i Spoleczna.* Warsaw. 1923. Vol. 1. No. 5–6–7. pp. 392–399. French summary p. 399.

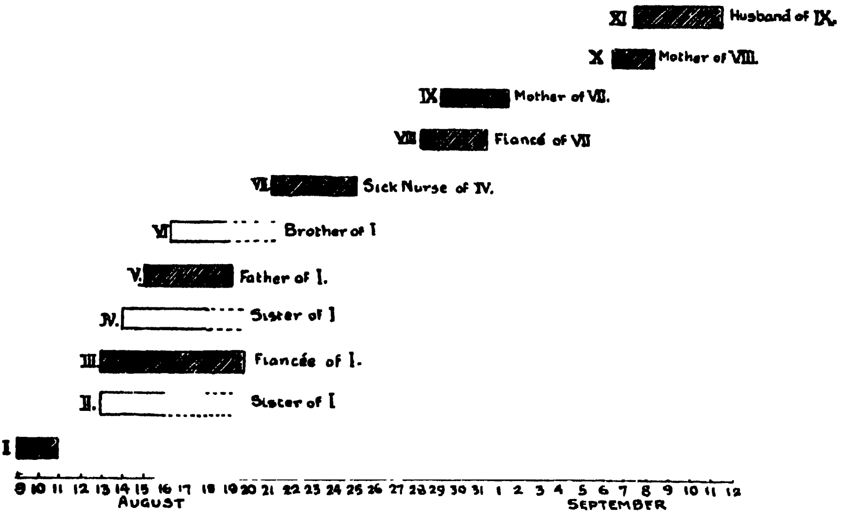
As the result of experiments on laboratory animals the author records the following summary :—

Anti-plague serum and anti-plague vaccine prepared with killed bacilli are not able to save guineapigs from death ; they only prolong the course of the malady. The problem of active and passive immunity for man is not solved. In the struggle against plague sanitary hygienic measures are, if not of unique, at least of the highest importance. [cf. this *Bulletin,* Vol. 19, p. 544 (Plague : a Review) ; Vol. 20, p. 357 (VASSALLO), p. 362 (JOLTRAIN & DE GENNES)].

J. H. T. W.

JORGE (Ricardo). **Sur la peste pneumonique (à propos de l'épidémie d'Alcochète).**—*Bull. Office Internat. d' Hyg. Publique.* 1923. Nov. Vol. 15. No. 11. pp. 1431–1439. With 1 chart. [1 ref.]

The author, Portuguese delegate to the Committee of the Office of International Hygiene, calls this report "a modest essay." Would that all reports were as modest and as well written. The initial case came from Lisbon ; a young dock labourer, aged 24. In the part in which he lived a few rare cases of bubonic plague had occurred, one in particular, a few days previous to his illness. When the man fell ill he returned to his home at Alcochete, on the banks of the Tagus, some fifteen miles from Lisbon. He arrived on August 9th and died two days later. From this source arose 8 cases of pneumonic plague and 2 suspects. From a clinical point of view the morbid picture was more or less uniform :—Rigors, a temperature rising to 40°C. or above ; bilateral pain in chest generally below the mammary line ; cough with rose-red sputum and occasionally haemoptysis ; pneumonic centres extending rapidly with myocarditis and death ; restlessness and agony but no delirium. The course of this small epidemic is fully explained by the diagram given below.



Pneumonic Plague at Alcochete. (The unshaded cases recovered.)
[From *Bulletin de l'Office International d'Hygiène Publique.*]

The author then proceeds to discuss pneumonic plague and the features of other epidemics.

J. H. T. W.

D'Aunoy (Rigney). **Studies on** *Bacillus Pestis.* **I. Optimum and Limiting Hydrogen-Ion Concentration for the Growth of** *Bacillus pestis.*—*Jl. Infect. Dis.* 1923. Nov. Vol. 33. No. 5. pp. 391–415. With 1 chart. [43 refs.]

The application of the conception of hydrogen-ion concentration to bacteriological technique has rendered possible a more exact knowledge of the metabolic activities of micro-organisms. The first two of these studies deal with the range of growth of *B. pestis* at varying hydrogen-ion concentrations and the final Ph in cultures of that organism, containing a fermentable carbohydrate. It was found that in the case of stock cultures growth occurred between fairly wide limits—Ph 5·0 and Ph 8·0—with optimum growth between Ph 6·2 and and Ph 7·0. Recently isolated strains proved more exacting and showed a decided optimum point between Ph 6·0 and Ph 6·6. The final Ph in cultures of *B. pestis* containing 1 per cent. dextrose is Ph 4·8, and this is uninfluenced by prolonged cultivation. The author's findings with regard to the action of this organism on carbohydrates correspond closely with previous work. Fifty strains were examined. All produced acid (no gas) with dextrose, galactose, levulose and mannite, the majority fermented arabinose and maltose, whilst a few only attacked glycerol and salicin. He concludes that carbohydrate fermentation is of no value as a basis for the classification of *B. pestis.* In the production of agglutinating sera (rabbit) the author found the use of dead cultures of little value. However, by intravenous inoculation of living organisms, at first attenuated by growth in alcohol broth, he obtained sera the titre of which varied from 1 in 6,000 to 1 in 15,000. These sera were tested with their homologous strains only, so that their value in identification or classification cannot be appraised. Finally, the phenomenon of bacterolysis was studied. This was shown to be due to the usual two factors, one destroyed by a temperature of 56° C. and the other at 68° C. and above. The presence of lytic bodies in the sera of human plague cases (both active and convalescent) proved inconstant and in the active cases bore no relation to the final issue. Protective anti-plague sera of various types were also examined, and found to possess little or no lytic action, and the results with various normal mammalian sera were entirely negative. The author is of the opinion, as the result of work not yet completed, that specific iso-electric points exist for the lysis of various organisms and suggests that the diversity of findings in his bacteriolytic experiments might be due to some such cause.

S. Phillips Bedson.

KISTER. **Endo-Nährböden bei der Pestdiagnose.** [Endo Medium in the Diagnosis of Plague.]—*Cent. f. Bakt.* I. Abt. Orig. 1924. Feb. 15. Vol. 91. No. 5. pp. 280–282.

In August, 1920, the sailing ship " Prince George," laden with wheat, arrived in Hamburg from Buenos Aires. 348 rats were caught and two of them were found infected with plague bacilli. In 1922, two steamers, also from Buenos Aires, were found to contain plague-infected rats. In the case of the " Arola Mendi " 50 rats out of 478 contained *B. pestis.* Diagnosis was rendered extremely difficult owing to the fact that these infected rats also contained *Proteus vulgaris* which on ordinary media covered the surface and smothered the *B. pestis* colonies. From such cultures it was difficult, in stained preparations, to find and count typical plague bacilli with bi-polar staining. This trouble was overcome by the use of Endo's medium. On this the growth of *P. vulgaris* is restricted, it grows in circumscribed colonies and does not obscure the *B. pestis* colonies. Thus by plating out and subculture pure cultures of *B. pestis* can be obtained. The author states that it is not sufficient to use the Endo medium according to its original composition ; but that the medium must be tested until the most favourable amount of fuchsin and sodium sulphite has been gauged.

J. H. T. W.

CACHIN. **La peste dans la province de Tananarive en 1922 et 1923.**—*Ann. de Méd. et de Pharm. Colon.* Paris. 1923. May–June–July–Aug. Vol. 21. [22 *sic.*] No. 2. pp. 186–204.

This long and statistical report of plague epidemics produces nothing new. For reports of previous outbreaks in Madagascar *v.* this *Bulletin* Vol. 19. p. 370–1 (DE GOYON, ALLAIN).

J. H. T. W.

DA COSTA (Nery). **Considerações em torno da prophylaxia da peste.**—*Rev. Med.-Cirurg. do Brazil.* 1923. Nov. Vol. 31. No. 11. pp. 523–534.

The question of prophylaxis against plague is discussed, especially as regards isolation, disinfection, and deratization.

H. Harold Scott.

BOIDIN (L.) & DE GENNES. **Adénite inguinale d'origine appendiculaire ayant simulé un Bubon pesteux.**—*Bull. et Mém. Soc. Méd. Hôpit. de Paris.* 1923. Nov. 29. Year 39. 3rd Ser. Vol. 47. No. 34. pp. 1599–1602. With 1 fig.

The bubo together with symptoms of general infection explain why one thought of the possibility of plague. Examinations in the laboratory rejected this diagnosis; no plague bacilli in the serous fluid of the bubo; inoculations into sensitive animals negative.

The full account of this long appendix with its hernial and gangrenous connexion with the inguinal gland can be read by surgeons to their great advantage. It is not for us.

J. H. T. W.

CHOLERA.

SANARELLI (G.). **De la pathogénie du choléra (neuvième mémoire). Le choléra expérimental.**—*Ann. Inst. Pasteur.* 1924. Jan. Vol. 38. No. 1. pp. 11–72. With 2 coloured plates. [24 refs.]

The coloured plates show vibrios in the intestinal walls and in the kidneys of rabbits that died of "experimental cholera" and the memoir itself is based upon, or repeats, experimental work described in previous "Mémoires." [See this *Bulletin,* Vol. 21, p. 72.] The author states that: It appears from my previous memoirs on cholera that the vibrios whatever their port of entry into the animal organism arrive ultimately, through the general circulation, in the digestive tube, their focus of election. My work removes the foundation of the ancient opinion which made the stomach the port of entry for the contagion of cholera.

[It has of course been shown long ago by other workers that the living vibrio infection may enter by other routes than the stomach alone; but we think it would be rash to exclude the stomach as a "port of entry."]

Prof. Sanarelli quotes from FERRAN's book (1893) describing the first anti-cholera vaccinations in Spain (1885) with living vibrios and deaths from undoubted cholera due to the vaccination.

J. H. Tull Walsh.

GOLOVANOFF (M.). **De l'action de la bile prise par la bouche sur la réceptivité vis-à-vis des vibrions choleriques injectés dans les veines.**—*C. R. Soc. Biol.* 1923. Dec. 22. Vol. 89. No. 37. pp. 1263–1264.

The question to be answered is: Can the rabbit be sensitized to the toxin of *V. cholerae* by doses of ox-bile? A culture of vibrios ("Pol" strain) was used which killed rabbits of 1,800 to 1,900 gm., when ¼–⅓ of a 24-hour growth was injected into the veins. The lethal dose being settled, other rabbits of the same weight were sensitized with bile (10 cc.) mixed with liquorice powder, by means of a tube. The following day they received another 10 cc. of bile [? These operations would cause shock and disturb gastric secretion]. Four hours later ⅓ of the lethal dose for such rabbits was injected into the vein of the ear. Control rabbits bore this dose (0·1 cc.) without inconvenience. The rabbits rendered sensitive by bile succumbed, generally in from 24 to 48 hours, with lesionsw hich characterize cholera.

[Cf. effects of bile in vaccination by the mouth, this *Bulletin,* Vol. 21, pp. 73–74. (GLOTOFF, GAMALEIA.).]

J. H. T. W.

BESREDKA (A.) & GOLOVANOFF (M.). **De la vaccination anticholérique. Étude sur l'immunité locale.**—*C. R. Soc. Biol.* 1923. Nov. 10. Vol. 89. No. 31. pp. 933–935. [12 refs.]

Cholera vibrios, killed at 60°C. (for 1 hour), injected under the skin or into the veins, give rise, as we know, at the end of 6–8 days, to several antibodies: bacteriolysins, agglutinins, sensitizers, etc. Their appearance is always accompanied by active immunity; and we do not hesitate in recognizing cause and effect.

We now recognize that there are cases in which immunity exists without the presence [?] of antibodies in the blood :—Anthrax, staphylococcus, streptococcus and dysenteric infections . . . . We call this local immunity and suppose that it is due to direct action of the microbe upon the receptive cells either in the skin or in the intestinal walls. As for staphylococcus and streptococcus we have succeeded in vaccinating the cells not only with the microbes but with soluble substances derived from them. (*C.R. Soc. Biol.*, Vol. 80., p. 7. & p. 506.)

Vibrio cultures, 8-10 days in the incubator, were filtered ; the filtrate was then re-sown with the same vibrios and kept at 37° C. for 8 days and again filtered. This second filtrate was used for the experiments. 1 to 2 cc. of this liquid were injected into guineapigs (about 400 gm. weight) into the skin, under the skin, into the peritoneal cavity or into the blood. Twenty-four hours after such preparation of the various subjects a lethal dose of living cholera vibrios was injected into the jugular vein.

Each series of experiments comprised 4 to 6 prepared guineapigs with 2 controls. All the controls died in from 12 to 18 or 24 hours. Among the "protected" animals there was a mortality of 1 in 5; but the majority resisted and showed no untoward symptoms.

Even if the vibrio filtrate is heated it retains its power, indeed it seems to gain in activity if heated to 100° C. or even 120° C. for one minute. Ingestion by the mouth has no effect. We thus obtain an atoxic soluble vaccine conferring immunity in the space of six hours and acting in all probability on the receptive cells of the intestine. The same effect is not obtained with emulsion of vibrio cultures in agar. Animals prepared with such an emulsion die like the controls when the lethal dose is given after 24 hours.

J. H. T. W.

CIUCA (M.) & BALTEANU (I.). **Vaccination anticholérique par voie cutanée chez le Cobaye.**—*C. R. Soc. Biol.* 1924. Feb. 8. Vol. 90. No. 4. pp. 315–317. [3 refs.]

Guineapigs vaccinated subcutaneously or by way of the peritoneal cavity resisted infection and remained healthy. In the blood of the guineapigs cutaneously vaccinated there was no trace of anti-bodies, agglutinins or bacteriolysins ; whereas the serum of guineapigs vaccinated by way of the peritoneum agglutinated vibrios up to 1 in 360 [see this *Bulletin*, Vol. 21, p. 73 (GLOTOFF and other references) ; p. 74 (GAMALEIA).]

J. H. T. W.

VAGLIANOS (M. S.). **Du sérum anticholérique purifié.**—*Ann. Inst. Pasteur.* 1923. Nov. Vol. 37. No. 11. pp. 943–945.

The original serum was obtained from immunized rabbits and its agglutinating power was 1 : 3,200. After drying in a vacuum over sulphuric acid it was redissolved in the proportion of 1·0 gm. dry matter to 2·0 cc. physiological salt solution. The syrupy liquid was placed in a water bath at 58° C. for three quarters of an hour and again dried in a vacuum. The golden needles which remained were by prolonged trituration reduced to a fine powder much less soluble in water than the dried original serum. 1·0 gm. of the powder added to 9·0 cc. saline solution showed, after twenty-four hours, two layers : a lower insoluble layer and an upper almost colourless layer of purified serum. The latter separated in the centrifuge from the solid matter is deprived (50 to 65 per cent.) of proteins as compared with the original serum. Experiments on guineapigs lead to the following conclusions :—

1. The agglutinating power of purified anti-cholera serum is practically equal to that of ordinary serum.

2. The prophylactic power does not differ from that of the original serum.

3. The protein content is notably less than that of the original serum.

J. H. T. W.

SUHATZEANOU (C. St.) & THÉODORASCO (C.). **Variabilité des réactions bio-chimiques des vibrions à l'égard des sucres.**—*C. R. Soc. Biol.* 1924. Feb. 8. Vol. 90. No. 4. pp. 318–320.

During a small epidemic of cholera in Roumania the authors isolated 13 strains of *V. cholerae ;* 2 of these came from two wells in an infected village. Nine other varieties, including type vibrios from the Paris Pasteur Institute, were also examined. The sugars used were : Glucose, lactose, laevulose, dextrose, maltose, saccharose, galactose, inulin ; also the alcohols, glycerine and mannite. The results were recorded after culture in the incubator for 20 hours on litmus agar to which the various sugars were added.

The two vibrios from the village wells did not attack any sugar or alcohol and seemed to resemble *V. iners* of BESSON, RANQUE and SENEZ. The other strains all attacked sugars and alcohols more or less with the exception of laevulose and lactose. [This record should be compared with that of NOURY & ALALOU, this *Bulletin*, Vol. 20, p. 738.]

J. H. T. W.

SHOUSHA (A. T.). **Spontaneous Agglutination of the Cholera Vibrio in Relation to Variability.**—*Jl. of Hyg.* 1923. Dec. Vol. 22. No. 2. pp. 156–163. [16 refs.]

Of two strains of *V. cholerae* tested, one (a haemolytic strain) yielded two variants " S " and " R " resembling those described by ARKWRIGHT [*Jl. Path. & Bact.*, 1921, Vol. 24] as occurring in the colon-typhoid group.

The " S " variant forms a stable emulsion in physiological saline and causes general turbidity in broth and peptone cultures. The " R " variant agglutinates spontaneously in physiological saline solution. In broth culture it forms a deposit, leaving the supernatant fluid clear. Emulsions in weaker saline solutions are stable, so that agglutination tests can be carried out.

The two variants differ in the following characters : (*a*) Cultural characters on agar ; (*b*) Acid agglutination optima ; (*c*) Agglutination with specific sera, absorption of agglutinin and complement fixation ; (*d*) Pathogenicity—" S " more pathogenic than the " R " type ; (*e*) Resistance to heat—" R." to a slight degree more resistant than " S."

They are identical as regards : (*a*) Motility ; (*b*) Fermentation of carbohydrates ; (*c*) Formation of indol ; (*d*) Proteolysis ; (*e*) Haemotoxin production.

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YAMAGUCHI (Kinji), NAGAI (Shunji), UNNO (Sachitane) & OCHIAI (Sadatoshi). **[On the Strains of** *Vibrio Cholerae* **occurring in the 1922 Epidemic in Chiba Prefecture with Special Reference to El Thor Strain.]**—*Chiba Igakkwai Zasshi* (*Jl. of Chiba Med. Soc.*). 1923. Mar. Vol. 1. No. 2. [Summarized in *Japan Med. World.* Tokyo. 1923. Oct. 15. Vol. 3. Nos. 9 & 10. p. 226.]

The authors' investigations were carried out with reference to KABESHIMA's classification of vibrios. They found that to a certain extent his classification was established as to agglutination, complement fixation, bacteriolysis *in vitro*, etc.; but from results which the authors obtained from bacteriolysis *in vivo* and from infection experiments the classification was inapplicable, because all the strains had a common nature indistinguishable one from another. [See this *Bulletin*, Vol. 21, p. 75 (NOBECHI & ISHIKAWA).]

J. H. T. W.

SANO (Takeshi). **[Immunological Investigation of the Blood of the Persons inoculated with Cholera Vaccine, Cholera Convalescent Cases and Cholera Carriers.]**—*Namman Igakkwai Zasshi* (*Jl. South Manchurian Med. Soc.*). 1923. Feb. Vol. 11. No. 4. [Summarized in *Japan Med. World.* Tokyo. 1923. Nov. 15. Vol. 3. No. 11. p. 244.]

The author found that the quantitative relation of immune bodies, especially of bacteriolysin, in the circulating blood of the vaccinated was as strong as that in the blood of convalescents. The climax in the former was met in 3 weeks while it fell as low as that of the normal blood in 10 months. In the circulating blood of the carriers no immune bodies have practically been demonstrable.

J. H. T. W.

MASHITA (Shinichiro). **[Experiment on the Infection Route in the Intestines of the Cholera Vibrio. I. Communication.]**—*Keio-Igaku* (*Keio Med. Jl.*) 1923. June Vol. 3. No. 6. [Summarized in *Japan Med. World.* Tokyo. 1923. Dec. 15. Vol. 3. No. 12. pp. 281–282.]

Rabbits and guineapigs were injected intravenously with cultures of cholera vibrio and the distribution of the vibrios in their bodies was examined at certain intervals. The main route was through the common bile duct and a few were demonstrated entering the intestinal lumen by passing through the intestinal wall. [cf. this *Bulletin*, Vol. 18, p. 73 (Recent Advances, etc.); also Index for papers by SANARELLI, GREIG and others.]

J. H. T. W.

DONG-NGOC-DIEU & MILLOUS. **Érythèmes au cours du choléra.**—*Ann. de Méd. et de Pharm. Colon.* Paris. 1923. May-June-July-Aug. Vol. 21. [22 *sic.*] No. 2. pp. 204–209. [2 refs.]

That erythema may occur with cholera is well known. The authors record seven cases and describe two of these in detail. In all the seven cases the erythema appeared somewhat late: 5th to 10th day of the disease. Injections of serum and saline solution had been given and these may possibly provoke erythema in some cases.

J. H. T. W.

BANERJEE (Dhirendra Nath). **Post-Infusion Reaction in Cholera.**—*Calcutta Med. Jl.* 1923. Oct. Vol. 18. No. 4. pp. 445–452. [13 refs.]

This reaction is generally recognized, but, nevertheless, the author has written a very full and interesting paper giving minute particulars of infusions injected, the management of severe reactions, etc.

J. H. T. W.

ENTERIC FEVERS IN THE TROPICS.

VIEIRA (F. Borges). **Estudo epidemiologico da febre typhoide em S. Paulo. Epidemia 1920-1921.**—*Ann. Paulist. Med. e Cirurg.* 1922. Apr. Year 10. Vol. 13. No. 4. pp. 90–116. With 11 graphs.

Enteric fever is endemic in S. Paulo, but also occurs in epidemic outbreaks. The disease is more prevalent in the warmer months and the author quotes instances (as New York and Philadelphia) to show that the seasonal curve in places with a good water supply is reversed where this is bad. The chief causes of prevalence are given as, firstly, a defective water supply, the curve of incidence beginning to rise some 4–5 weeks after the onset of heavy rains which wash surface pollution into the wells; and, secondly, the plague of flies and consumption of salads and uncooked fruit.

587 cases were notified and for the purposes of this study 393 were carefully investigated. The incidence was found to be greatest between the ages of 16 and 20 years. The age-mortality figures are not of much value as the grouping is too comprehensive, the highest death rate being given as occurring between the ages of 20 and 50 years. Sex had but little influence on either incidence or mortality, the comparative rates being in both cases males to females as 5 to 4.

[Notification was perhaps not very thorough, but the following line of reasoning for computation of cases does not appear to be very reliable. Of the 587 cases notified 187 died (31·8 per cent.). But, argues the writer, there is no reason why the mortality should exceed 10 per cent. "This would imply 1,870 cases so that nearly 1,300 escaped notification!"] [cf. this *Bulletin*, Vol. 16, p. 447 (Rangel Pestana).]

H. Harold Scott.

STIBBE. **Typhoid on E.R.P.M.** [East Rand Proprietary Mines, Ltd.]. **Oral Administration of Vaccine.**—*Proc. Transvaal Mine Med. Officers' Assoc.* 1924. Jan. Vol. 3. No. 9. pp. 12–14.

During a small outbreak including 26 cases of typhoid fever the author gave a vaccine by the mouth to some 2,000 boys in Compound "A." Nine cases were admitted between September 27th and October 3rd. From October 5th to 8th daily doses of vaccine, together with an ox-bile pill were administered. The following table gives full particulars and compares the orally vaccinated group with the boys of Compounds "B," "C" and "D," who did not receive any vaccine:—

Typhoid on E.R.P.M., September 27th to December 31st, 1923.

(1) Incidence.

	September 27 to October 3.	October 5 to December 31.
Compound A. 2,000 boys.	Before vaccine. 9 cases in 7 days.	After vaccine. 3 cases already incubating when vaccine was given. 4 new cases.
Compound B, C and D. 8,000 boys.	No vaccine. 2.	No vaccine. 8.

(2) Clinical Course of Cases.

	Without vaccine.	With vaccine.
No. of Cases.	19.	7.
Died.	7 or 37 per cent.	2 or 29 per cent.
Returned to work.	9 or 47 per cent.	5 or 11 per cent.
Repatriated.	3 or 16 per cent.	—
Loss to Mine.	10 or 53 per cent.	2 or 29 per cent.
Duration of illness of survivors.	12 c/s 242 days = 20 days	5 c/s 71 days = 14 days each.
Convalescence	12 c/s 155 days = 13 days each	5 c/s 56 days = 11 days each.
Total days lost.	397 days = 33 days each	127 days = 25 days each.
Relapses.	2.	None.
Symptoms	Delirium in one-third of cases Maximum temperature 104·5 Average Maximum 103·8	No delirium. Maximum temperature 102·8 Average Maximum 102·2
Condition as to weight at end of treatment	12 boys lost 116 lbs. Average loss 9 6 lbs.	5 boys lost 6 lbs. Average loss 1·2 lbs.
Sequel.	One Osteitis of femur. One Otorrhoea (chronic) One abscess of jaw.	None so far

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CORNWALL (J. W.) & LA FRENAIS (H. M.). **The Mechanism of Infection by** *B. typhosus.*—*Indian Jl. Med. Res.* 1924. Jan. Vol. 11. No. 3. pp. 883–913. With 6 charts. [6 refs.]

This careful experimental work on rabbits, illustrated with useful charts and tables, has led to the following conclusions :—

" 1. The stomach of a rabbit forms an absolute barrier to the passage of *B. typhosus.*

" 2. If *B. typhosus* be introduced into the intestinal canal of a rabbit beyond the stomach barrier it will flourish there.

" 3. *B. typhosus* migrates from the lumen of the jejunum of a rabbit and can be found in the peripheral circulation within an hour.

" 4. A jejunal injection of one agar slope of living typhoid bacilli does not generally cause serious illness in a rabbit.

" 5. Given certain conditions, *B. typhosus* can pass the stomach barrier of man. When those conditions do not prevail the stomach of man will act as an efficient barrier.

" 6. *B. typhosus* can, in small numbers, pass through the skin and probably also the conjunctiva and nasal and pharyngeal mucous membranes of rabbits. It is not, however, likely that the bacillus could succeed in establishing itself in the mesoderm of either the rabbit or man through these portals of entry.

" 7. If the effect of any method of immunization is to establish a local immunity of the intestinal epithelium it should be possible to prove such immunity by giving an intrajejunal injection of living bacilli, which should not be followed by a large rise in the agglutination titre of the serum.

"8. Immunity against typhoid in man depends (1) on the degree of ability of the endoderm to prevent the passage of the baccilli through it, (2) on the degree of ability of the cells of the mesoderm to withstand the noxious effect of toxin liberated in it by the death of the bacilli which have penetrated the endoderm.

"Prophylactic treatment, therefore, should have a double aim in view.

"9. *B. typhosus* occasionally can be latent in the tissues of a rabbit for many months and then can break its bounds and cause a fatal issue."

J. H. T. W.

CHARLES (Havelock). **La fièvre typhoïde. Réponse au questionnaire pour l'Inde Britannique. [Questionnaire envoyé conformément à la décision prise par le Comité de l'Office International d'Hygiene publique en octobre 1922.]**—*Bull. Office Internat. d'Hyg Publique.* 1923. Sept. Vol. 15. No. 9. pp. 1210-1216. With 1 chart.

An official compilation from Indian Reports on the enteric fevers among troops, prisoners in civil jails and the general population.

J. H. T. W.

HEATSTROKE.

WEILL (E.) & BERTOYE. **[Heatstroke in Infants.]**—*Nourrisson.* Paris. 1923. May. Vol. 11. p. 145. [Summarized in *Jl. Amer. Med. Assoc.* 1923. Oct. 6. Vol. 81. No. 14. p. 1241.]

Eight out of 16 infants suffering from heatstroke died in a Lyons hospital during a hot wave in 1922. All seemed to be doing well when suddenly their temperature rose and remained high with no morning decline. The skin and mucous membrane of mouth and nose were dry, the pulse small and often uncountable; extreme restlessness but no convulsions and no gastro-intestinal trouble. The deaths occurred after three days. The eight that recovered showed no sequelae. Although the month was May the thermometer registered 93·2° F. in the shade. 86° F. is dangerous for infants especially when humidity is high. Cool baths ten to twenty minutes every three hours were of benefit to some cases.

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FINNY (Charles M.). **Sunstroke or Heatstroke?**—*Indian Med. Gaz.* 1918. Oct. Vol. 53. pp. 361–369. [Received June, 1923.]

Work done in succeeding years and reviewed in Vols. 16, 18, and 20 of this *Bulletin* render unnecessary any notice of this belated essay, which, if it had arrived earlier, would have called for consideration in detail. The author has minutely examined the different forms of injury produced by direct and indirect sun power and gives a long list of "precautions."

J. H. T. W.

FABRIS (Angiolo). **Osservazioni anatomo-istologiche sul colpo di calore.**—*Riforma Med.* 1923. Aug. 13. Vol. 39. No. 33. pp. 775–781. [24 refs.]

In addition to the author's careful record of the changes observed in the brain and other organs, he gives a useful bibliography with reference to French, German and Italian journals.

J. H. T. W.

TROPICAL OPHTHALMOLOGY: A REVIEW OF RECENT ARTICLES.

CONJUNCTIVITIS.—There have been several interesting communications on this subject.

Samoan Conjunctivitis. HUNT [1] has been studying this disease bacteriologically with the aid of cultures, and has been able to make some experiments on healthy subjects. He has arrived at the conclusion that the diplococcus of Samoan conjunctivitis is an attenuated form of gonococcus.

Folliculosis of the conjunctiva is to be sharply distinguished from trachoma (VELDEE) [2]; its maximum of incidence is at 5 to 6 years of age, and it steadily disappears as the child grows up. It is definitely related to tonsilar trouble, but the exact relation has not been determined. As compared with trachoma it runs a brief course and disappears spontaneously without sequelae.

Membranous Conjunctivitis. The Ophthalmological Society of Egypt devoted special attention in their 1923 Session to this subject. GIRGIS [3] published the notes of an epidemic of 19 cases of diphtheritic conjunctivitis at Assiout in September 1922, whilst three more diphtheritic cases and 40 non-diphtheritic appear in the same year's report. MACCALLAN & RASHEED Bey [4] point out that the staphylococcus, the streptococcus, the pneumococcus, the gonococcus, and the Koch-Weeks bacillus as well as the Klebs-Loeffler organism may each and all produce a membranous conjunctivitis. The non-diphtheritic cases are less severe than the diphtheritic. Infection with the Klebs-Loeffler bacillus may take place (1) directly by contact, or by fly-transmission from case to case; (2) through a diphtheria carrier who presents no symptoms; (3) by such a carrier suffering from nasal catarrh; (4) through dust infected by dry membranes, etc.; and (5) by want of care in the out-patient department. Paresis of accommodation may occur as the result of a previously undiagnosed attack of ophthalmia (SOBHY Bey) [5] though such an event would appear to be a very rare one. The true diphtheritic conjunctivitis appears in Egypt to pass from eye to eye and not to be acquired by contact with the usual forms of the disease. Corneal ulceration and loss of one or both eyes is very common, due to the fact that diphtheritic, like other forms of tropical conjunctivitis is often a mixed infection. Methods of prophylaxis and treatment are described in the papers quoted.

IRREGULAR PRACTITIONERS.—In 1921 48 cases were observed of a peculiar affection of the lids amongst the out-patients of an Egyptian hospital. It proved to be a primary syphilitic infection of the lids as the result of a practice by two female quacks of licking their patients' eyes with their tongues as an alleged cure for various infections, or with the view of extracting hypothetical worms from their eyes. (SADEK).[6] Beside this may be placed an epidemic of 56 cases of gonorrhoeal conjunctivitis amongst German soldiers. The source of the infection was traced to the soiled fingers of an attendant, whose duty (!) it was to avert the lids for the routine inspection of the eyes (LINDNER).[7]

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[1] HUNT (D.). Samoan Conjunctivitis: A Study of the Causative Organism.—*U.S. Naval Med. Bull.* 1923. Oct. Vol. 19. No. 4. pp. 410–413.

[2] VELDEE (Milton V.). An Epidemiological Study of Folliculosis of the Conjunctiva.—*U.S. Public Health Rep.* 1923. Dec. 7. Vol. 38. No. 49. pp. 2877–2887. With 1 chart. [2 refs.]

[3] GIRGIS (A. M.). An Outbreak of Diphtheritic Conjunctivitis.—*Ophthal. Soc. of Egypt, Bull. of* 1923. pp. 36–42.

[4] MACCALLAN & RASHEED Bey. Introductory Address on Membranous Conjunctivitis.—*Ophthal. Soc. of Egypt, Bull. of* 1923. pp. 25–35.

[5] SOBHY Bey (M.). Paralysis of Accommodation after Faucial Diphtheria without Mydriasis.—*Ophthal. Soc. of Egypt. Bull. of* 1923. pp. 43–45.

ECLIPSE AMBLYOPIA.—WRIGHT & VENKATARANGAM NAIDU[8] have examined 21 cases of this condition at Madras after the eclipse of the sun on September 21st 1922. The most striking features of a very interesting communication are (1) the mildness of the damage inflicted, (2) the marked and rapid improvement which occurred, and (3) the absence of definite scotomata. They also observed macular changes in the retina of a man who had been an habitual sun-gazer for three years.

DAMAGE TO THE EYE BY LIGHTNING.—A lady of 23 was rendered unconscious for 20 minutes after being struck by lightning. The symptoms included clouding of the aqueous and cornea, cyclitis, progressive opacification of the lens, and inflammation of the retina and choroid. The lens opacities commenced over four weeks after the accident (WAARDENBURG).[9] GJESSING[10] described the characteristic features of an electric cataract examined with the Gulstrand slit-lamp in a boy of 12, who, one year earlier, short circuited a 50,000 volt current.

ACCIDENTAL INJURIES.—GANGULY'S[11] two cases of severe eye injury, one from the bursting of a soda-water bottle, and the other from that of a bottle containing an effervescing mixture, which was being made up by a compounder, emphasize the lesson that strong leather covers should be provided for and used when opening soda-water bottles in the Tropics, and that a similar precaution should be taken in dispensaries there.

AMOEBIC IRITIS.—It has for some time past been recognised that iritis may be a sequel of amoebic dysentery. Lloyd MILLS[12] of Los Angeles has reported four cases of chronic recurrent, intractable, bilateral iritis, associated with constipation, lassitude, anaemia, low blood pressure, tenderness of the colon, and the presence in the stools of ***Entamoeba histolytica***, in which the adoption of a specific antiamoebic treatment led to prompt and lasting cure both of the amoebiasis and of the iritis in two cases, whilst the other two were reported as greatly improving under treatment. Amoebic infection of the human intestine is very wide spread ; diarrhoea is not an essential sign of the infection, and in the temperate zone all signs of dysentery are usually absent. Mills appears to have discovered for us one more of the hidden sources of auto-intoxication that have so long baffled the ophthalmologist.

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[6] SADEK (M. T.). Palpebral and Conjunctival Syphilitic Manifestations.—*Ophthal. Soc. of Egypt. Bull. of* 1923. pp. 82–88. With 2 plates.

[7] LINDNER (K.). Ueber eine Endemie von 56 Gonoblenorrhöen.—*Klin. Monatsbl. f. Augenh.* 1920. Vol. 65. pp. 637-642.

[8] WRIGHT (R. E.) & VENKATARANGAM NAIDU (T.). Eclipse Amblyopia — *Amer. Jl. Ophthal.* 1923. Oct. Vol. 6. p. 812.

[9] WAARDENBURG (P. J.). *Neth. Ophthal. Soc.* 1920. Dec. Reported in *Amer. Jl. Ophthal.* 1923. Jan. Vol. 6. No. 1. p. 42.

[10] GJESSING (H. G. A.). A Case of Cataract electrica, examined with Gulstrand's Slit-lamp.—*Brit. Jl. Ophthal.* 1922. Vol. 6. pp. 447–451.

[11] GANGULY (S. K.). Some Eye Cases. — *Indian Med. Gaz.* 1923. Aug. Vol. 58. No. 8. p. 379.

[12] MILLS (Lloyd). Amoebic iritis occurring in course of non-dysenteric amoebiasis. —*Arch. of Ophthal.* 1923. Nov. Vol. 52. No. 6. pp. 525–545.

LEPROSY.—VAN DRIEL'S[13] paper, founded on his study of the disease in Sumatra, is a valuable contribution, which will well repay a thorough study in the original. He has two institutions under his care, in one of which the patients are agriculturists, singularly free from syphilis, yaws, tubercle, trachoma, and gonorrhoea; in the other the patients are estate coolies, mostly Chinese, amongst whom syphilis and trachoma are very common. In the former hospital there are many slight and early cases of leprosy, whilst in the latter the disease is advanced in type. Comment is made on a number of interesting clinical points. Van Driel is disposed to attribute a leprotic origin to a form of superficial punctate keratitis, which occurs quite early in the disease, and in about 3 to 4 per cent. of the cases. He also finds that a leprotic iritis or iridocyclitis occurs in quite a large percentage of cases (14·50 in one institution, and 22 per cent. in the other). He holds that the lepra bacilli find their way into the eye via the blood-stream, and not by extension from the surrounding skin. The amount of blindness actually due to leprosy in Sumatra is astonishingly small as compared with that noted in other countries where the disease prevails.

TUBERCLE.—MEYERHOFF[14] has been studying tuberculous disease in Egypt, and has satisfied himself that some of the cases of endogenous iritis met with in that country are due to the tubercle bacillus, and that considerable benefit may be obtained in suitable cases by the use of tuberculin. He does not think that tuberculosis of the eye is very rare in Egypt. The reviewer would go further and record his belief that it is far commoner than it is generally supposed to be in tropical countries, and that there is a great call for the use of accurate and modern methods of diagnosis in this connexion.

CATARACT.—MAHMOUD ZAKY[15] insists on the importance of attention to the teeth before cataract extraction is undertaken and draws attention in this connexion to the foul dental condition of many tropical patients. Dr. MacCallan has directed that every patient before an operation for cataract or glaucoma in Egypt must have any decayed teeth removed, and the mouth carefully cleansed; a complete set of tooth forceps is provided for the purpose in every ophthalmic hospital, an example which might with advantage be widely followed. HOWARD[16] speaks of the value of the conjunctival bridge as a safeguard against vitreous loss and other trouble in cataract extraction in China. CRUICKSHANK[17] lays stress on the difficulties that surround the operating ophthalmic surgeon in India, and rightly insists on the need for a careful routine examination of each patient before operation is undertaken. BELL,[18] speaking from American experience, advises the instillation of two drops of a 1 per cent. silver nitrate solution into the eye before cataract extraction in order to promote phagocytosis and the formation of antibodies; the fact that he has abolished suppuration from his clinic by so doing should encourage tropical surgeons to imitate him.

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[13] VAN DRIEL (B. M.). [Affections of the Eye in Leprosy.]—*5th Congress Far Eastern Assoc. Trop. Med. held at Malaya, Sept.* 3–17, 1923. Singapore.

[14] MEYERHOFF. Some Observations regarding Tubercular Eye-Diseases in Egypt.—*Ophthal. Soc. of Egypt. Bull. of* 1923. pp. 126–130.

[15] MAHMOUD ZAKY. Buccal Infection and Eye Diseases. Two Cases of Insidious Iritis appearing some Days after Cataract Extraction and relieved only by Removal of Decayed Teeth Roots.—*Ophthal. Soc. of Egypt. Bull. of* 1923. pp. 122–125.

[16] HOWARD (Harvey J.). A Conjunctival Bridge as a Safeguard against Vitreous Loss in Cataract Extraction.—*China Med. Jl.* 1923. Sept. Vol. 37. No. 9. pp. 709–715. With 1 plate. [6 refs.]

[17] CRUICKSHANK (M. M.). A Note on the Complications following 1,322 Consecutive Cases of Cataract Extraction.—*Indian Med. Gaz.* 1923. Oct. Vol. 58. No. 10. pp. 461–467.

DIABETES.—DE [19] publishes a case of a young woman whose urine was loaded with sugar and who presented complete loss of all movements of the eyeball together with ptosis and other symptoms. Other treatment failing, the glycosuria was attended to with noticeable return of the movements of the eyeball. PETERSON,[20] speaking from experience in China, considers that, when operating on diabetic cases, it is unwise to stop carbohydrate food as the restriction may induce acidosis and delay healing.

GLAUCOMA.—In publishing the notes of a case in which an affection occurred two years after trephining, MAZNY Bey [21] raised a discussion in a meeting of the Ophthalmological Society of Egypt " as to whether in our country of Egypt, late infection is rare or common," with a view to determine whether the Elliot operation can still be retained as the operation of election for the treatment of non-congestive glaucoma in all the Egyptian hospitals. He was led to do this by the bad results which have been published from Central Europe. A number of speakers took part in the discussion, from which there emerged certain very definite conclusions : (1) That Elliot's operation for chronic primary glaucoma is the operation of election in Egypt ; (2) that the technique in that country in performing that operation is at a high level ; several of the speakers appeared to think that the bad results in Central Europe were due to defective technique ; (3) that late infection is a rare complication in Egypt, despite the fact that conjunctival infections are abnormally common there ; and (4) that the trephine operation should certainly not be abandoned in that country. GANGULY [22] records a case of glaucoma following epidemic dropsy and provoked by the instillation of a 5 per cent. cocaine solution. KIEP[23] advocates the use of butyn in preference to cocaine in tropical practice and especially for glaucoma work ; he says it is more powerful, more rapid, more prolonged in its action, and less toxic than cocaine, and that it does not dry the cornea or dilate the pupil ; it produces no ischaemia and it can be boiled without impairing its efficiency. The *British Journal of Ophthalmology* for April 1924 (p. 172) sounds a note of warning on the subject of the use of this drug in other specialities. It would be well for ophthalmic surgeons to read what it has to say.

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[18] BELL (George H.). Further Observations on "New Methods of Preventing Post-operative Intraocular Infections." Report of 1,250 Successful Cases.—*Arch. Ophthal.* New York. 1923. Vol. 52. pp. 436–447.

[19] DE (J. C.). A Case of Ocular Paralysis with Glycosuria.—*Indian Med. Gaz.* 1923. Dec. Vol. 58. No. 12. pp. 589–590.

[20] PETERSON (R. A.). Some Valuable Aids in Ocular Therapeutics.—*China Med. Jl.* 1923. Oct. Vol. 37. No. 10. pp. 842-847. [5 refs.]

[21] MAZNY Bey. A Case of Late Infection after Elliot's Sclerocorneal Trephining and Some Remarks on Incidence in Egypt.—*Ophthal. Soc. of Egypt. Bull. of* 1923. pp. 113–116.

[22] GANGULY (S. K.). Some Eye Cases.—*Indian Med. Gaz.* 1923. Aug. Vol. 58. No. 8. p. 379.

[23] KIEP (W.). The Use of Butyn in Ophthalmic Practice.—*Ophthal. Soc. of Egypt. Bull. of* 1923. pp. 89–100.

EYE CONDITIONS IN THE TROPICS.—STUCKEY[24] finds that errors of refraction and eye strain are very common in China. In Pekin University 50 per cent. of the students required glasses; in a boys' school 45 per cent. and in a girls' school 39 per cent. had the same need. There is a steadily increasing number of students requiring a correction of their refraction and practically nothing is being done for them. Stuckey therefore puts forward a number of proposals for the organization of the Missionary Societies with a view to taking this work in hand. LING[25] discusses the causes of blindness amongst the Chinese. Trachoma is the paramount factor in Pekin, and he believes in North China generally, and probably in the whole of China. The figure for gonorrhoeal blindness is low and is contrary to what has been previously stated for China. The cataract rate (7·8 per cent.) is also low, whilst the glaucoma rate is very close to it (6·8 per cent.); this is in marked contrast with Indian experience. His dictum " stamp out trachoma, and an immense number of people will be saved from going blind in China " is of practical interest. DE RUYTER[26] compares the relative frequency of certain eye diseases in Holland and in Java. He lays stress on the mental attitude of the Javanese and on the appalling prevalence of trachoma amongst them. Cataract is not more frequent in Java than in Europe and the eye symptoms of malaria are said to be negligible in the island. Xerosis of the cornea and keratomalacia are very common amongst the Javanese. JOHNSTONE,[27] in a medical survey of the Kavirondo District of Kenya Colony, places the disability due to eye disease there at 1·3 per cent. among the children and 3 per cent. among the adults. The interest lies in the fact that this is one of the earliest communications dealing with the subject.

OPHTHALMOMYIASIS.—STARK'S[28] case of ophthalmomyiasis presents several features of interest:—(1) The maggots found in the patient's eye were deposited there by a flying insect; sufficient evidence has recently accumulated to place this method of infection beyond dispute. (2) The signs and symptoms caused by the parasites were very marked. (3) The larvae were identified as those of *Oestrus ovis*, the common sheep bot-fly, which deposits its larvae in the nostrils of the sheep in the course of its flight. DAVIS,[29] in a case of myiasis of the ear, was able to kill the larvae and relieve the symptoms by the instillation of a lotion of equal parts of milk and chloroform, when other stereotyped methods of treatment had failed; doubtless the same solution would act in orbital cases.

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[24] STUCKEY (E. J.). A Plea for the Routine Examination of the Vision of School Children in China.—*China Med. Jl.* 1923. Aug. Vol. 37. No. 8. pp. 650–656.

[25] LING (W. P.). Causes of Blindness among the Chinese.—*Nat. Med. Jl. China.* 1923. Sept. Vol. 9. No. 3. pp. 175–184. [2 refs.]

[26] DE RUYTER (J.). Oogziekten op Java.—*Geneesk. Tijdschr. v. Nederl.-Indie.* 1923. Vol. 63. No. 6. pp. 945–950.

[27] JOHNSTONE (F. J. Carlyle). The Biology and Pathology of the Natives of the Central Kavirondo District, Kenya Colony.—*Trans. Roy. Soc. Trop. Med. & Hyg.* 1923, Dec. 13, & 1924, Jan. 17. Vol. 17. Nos. 6 & 7. pp. 369–377.

[28] STARK (H. H.). Ophthalmia Myiasis Externa, due to Larvae of *Oestrus ovis.*—*Jl. Amer. Med. Assoc.* 1923. Nov. 17. Vol. 81. No. 20. pp. 1684–1685. With 2 figs.

[29] DAVIS (L. L.). Myiasis of the Ear.—*U.S. Naval Med. Bull.* 1923. Sept. Vol. 19. No. 3. pp. 345–348.

FILARIA LOA.—KIMBERLIN[30] removed a *Loa loa* from the conjunctiva by seizing it first with forceps and then instilling cocaine as a preliminary to the operation.

QUININE AMBLYOPIA.—The outstanding feature of interest in EVANS'[31] case was the appearance of fundus changes, viz., (1) plaque-like spots of exudate found at intervals along the arteries, and (2) small disciform spots scattered throughout the fundus which faded and were replaced by others in different situations. BOLLACK and LAGRANGE[32] also contribute a case of permanent and severe visual damage as the results of the treatment of malaria by quinine following a dose of 3 gms.; the patient had been taking quinine for some time previously.

HYPOPYON KERATITIS.—IACOBELLIS[33] has treated seven cases of severe hypopyon ulcers with subconjunctival injections of milk with very gratifying results. Other treatment was also adopted. Injections of 0·50 cc. to 1 cc. of fresh milk, boiled for 5 minutes, were made under cocaine every other day, until complete recovery, under the bulbar conjunctiva. Hot fomentations were applied after the injections. General reaction was absent and local reaction was not severe.

TRACHOMA.—The literature of this subject is becoming very large—one might almost say disproportionately so—in comparison with that of tropical ophthalmology generally. Indeed, a large number of the papers published are not of very great interest, but they reflect the growing anxiety in many lands as to the progress of this disease, and the conviction that a great deal could and should be done to stamp it out. MCMULLEN[34] records the results of a three-year trachoma campaign carried out in Knott County, Ky., in the light of a survey made ten years later; it would appear that one of the worst infected regions of America has been practically cleared of the disease within a period of ten years as a result of this campaign. Again in a Public Health Congress held at Marseilles at the close of 1922[35] the same subject came up, and it was proposed to form a National Anti-trachomatous League amongst the doctors and administrators interested in trachoma with headquarters in Paris, and with local branches in the large colonial centres. Statutes for the proposed League were drawn up and presented to the meeting.

In October 1923 we find the League Against Trachoma meeting in the Pasteur Institute, Paris, and discussing amongst other subjects (1) trachoma in Lorraine; (2) new researches on the histology and cytology of trachoma, (3) the difficulties of diagnosing incipient trachoma, (4) trachoma in Marseilles in 1923, and (5) the fight against trachoma with an advocacy of propaganda by the aid of the film. GIFFORD[36] has discussed the incubation period of trachoma, which he fixes at one week, and the contagiousness of the disease even in its atrophic stage. He does not believe that the African native is immune to trachoma, but thinks that his so-called immunity is merely a question of race segregation. At the Marseilles Congress above referred to the comparative rarity of the disease in Madagascar was remarked upon.

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[30] KIMBERLIN (J. W.). *Filaria loa* Report of Case of Removal from the Subconjunctival Tissues—*Jl. Amer. Med. Assoc.* 1923. Nov. 17. Vol. 81. No. 20. pp. 1685–1686. [10 refs.]

[31] EVANS (J. N.). Quinin Amblyopia.—*Amer. Jl. Ophth.* Chicago. 1923. 3rd Ser. Vol. 6. pp. 271–275.

[32] BOLLACK (J.) & LAGRANGE H.). *Soc. d'Ophth. de Paris.* 1923. Dec. Rep. *Amer. Jl. Ophth.* 1923. Vol. 6. p. 852.

[33] IACOBELLIS (G.). *Arch. di. Ottal.* 1922. Vol. 29. p. 468.

[34] MCMULLEN (John). Results of a Three-Year Trachoma Campaign begun in Knott County, Ky., in 1913. As shown by a Survey in the same Locality 10 years later.—*U.S. Public Health Rep.* 1923. Oct. 26. Vol. 38. No. 43. pp. 2463–2466.

[35] *Congrès de la Santé Publique et de la Prévoyance Sociale, Marseille, 11–17 Septembre 1922. Comptes Rendus des Séances.* pp. 404–450.—1922. Marseille. Commissariat Général de l'Exposition Coloniale, 5 rue Noailles.

EL RASHEED Bey,[37] in a paper full of interest, and redolent of hard work and close observation, discusses the vascularization of the cornea so frequently seen in the eyes of Egyptians, and decides that the presence of a few short vessels on the upper corneal margin seen in the eyes of his compatriots is not evidence of past trachoma. SMITH[38] writes from China on the bacteriology of the disease and makes the following interesting points: (1) The Credé method is specific against the gonococcus but fails against an inclusion blenorrhoea; (2) the inclusions are not involution forms of the gonococcus; (3) both children and adults may have an infection of the eyes or of the genitalia either by the gonococcus, or by the inclusion disease, or by both together; (4) the inclusion disease produces scar tissue formation just as trachoma does; the gonococcus produces no scarring; (5) the inclusion disease is analogous or identical with trachoma. The above conclusions are largely borrowed from LINDNER'S work. A number of papers have appeared on the treatment of the disease:—ADDARIO LA FERLA[39] enthusiastically advocates Sculco's method. LACAT,[40] of Paris, recommends a very drastic *brossage* with the use of 1 in 500 cyanide of mercury. JUNÈS[41] uses subconjunctival infiltrations of solutions of the latter drug. CASSIMATIS[42] has been unfavourably impressed with the results of Abadie's new method and enters a warning against it. Hassan BARRADA[43] is strongly in favour of a modified Combined Excision Operation in selected cases, and TEWFIK[44] writes on the advantages of the continuous buried suture in septic cases where Snellen's Operation for trichiasis is undertaken.

R. H. Elliot.

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[36] GIFFORD (H.). *Amer. Jl. Ophthal.* 1923. Mar. Vol. 6. No. 3. p. 221.

[37] EL RASHEED Bey (A. F.). Is the presence of a Few Short Vessels on the Upper Corneal Margin in an Egyptian Pathognomonic of Trachoma? —*Ophthal. Soc. of Egypt. Bull. of 1923.* pp. 61–72.

[38] SMITH (D. V.). The Bacteriology of Trachoma.—*China Med. Jl.* 1923. Nov. Vol. 37. No. 11. pp. 887-891. With 4 text figs.

[39] ADDARIO LA FERLA. *Arch. di Ottal.* 1922. Vol. 29. p. 219.

[40] LACAT. Traitement de la conjonctivite granuleuse.—*Ann. d'Ocul.* Paris. 1923. Vol. 160. p. 579. & *Clin. Ophth.* Paris. 1923. Vol. 27. pp. 363–373.

[41] JUNÈS (Emile). Le Trachomthérapie par l'infiltration sous-conjonctivale de cyanure de mercure.—*Gaz. des Hôpit.* 1923. Feb. 20 and 22. Vol. 96. No. 15. pp. 237–242. & *Clin. Ophth.* Paris. 1923. Vol. 27. pp. 183–197.

[42] CASSIMATIS (C.). Blépharoptose consécutive au traitement du trachome par la nouvelle méthode du Dr. Abadie et quelques reflexions sur cette méthode.—*Ophthal. Soc. of Egypt. Bull. of 1923.* pp. 75–81.

[43] BARRADA (Hassan). A Few Hints on the Combined Excision Operation with a New Device for Selected Cases.—*Ophthal. Soc. of Egypt. Bull. of 1923.* pp. 108–110.

[44] TEWFIK (M.). The Continuous Buried Suture in Snellen's Operation for Trichiasis and its Preference in Cases with Unclean Lids, Conjunctival Discharge, Corneal Ulcers, etc.—*Ophthal. Soc. of Egypt Bull. of 1923.* pp. 111–112.

MISCELLANEOUS.

MÜLLER (O.) & JUSTI (K.). **Beitrag zur Kenntnis der klimatischen Bubonen.**—*Arch. f. Schiffs- u. Trop.-Hyg.* 1914. Dec. Vol. 18. Beiheft 8. 32 pp. With 8 charts and 1 coloured plate [31 refs.] [Received 1923.]

The conclusions of this careful paper from Hong Kong, where the authors saw 30 cases of climatic bubo and studied 8 with care, are to the following effect. Neither clinically nor histologically does the disease tend towards recovery; if left to itself it progresses. It should therefore be dealt with surgically as early as possible. The point of entry of the virus was in three instances surmised to be an infiltration of the prepuce and the authors believe that early examination might demonstrate this in every case. They suggest that the germ might be discovered by inoculating the gland juice into healthy skin and they believe it to be one that acts on gland tissue like the diphtheria bacillus.

Three questions remain unanswered: Why is climatic bubo associated with hot countries? Why is it chiefly met with in ships' crews and at Hong Kong, in three-fourths of the cases, in the engine room personnel? Why is it not found in women and especially in prostitutes who must be regarded as the carriers of the infection?

The histories of the 8 cases are set out at length and in tabular form and it is noted that in every instance coitus had taken place three weeks from the onset of lymphadenitis [see this *Bulletin*, Vol. 1, p. 474, and Vol. 2, p. 207]. Three cases infected at Batavia had visited the same brothel.

A. G. B.

BUTLER (C. S.). **Climatic Bubo.**—*U.S. Nav. Med. Bull.* 1924. Jan. Vol. 20. No. 1. pp. 1–6.

A didactic paper without personal observations. The author quotes RUGE, in 60 per cent. of whose 36 cases the buboes resolved, and recommends expectant treatment. SPEAR, to whom Butler submitted his paper, does not agree that 60 per cent. recover without operation [nor is this the general opinion] and advises a clean dissection of the glands with the removal of all the overlying skin and no attempt to sew the wound up. He treated thus 10 cases in Cuba.

A. G. B.

LISTER (Spencer). **The Use of Pneumococcal Vaccine.**—*Proc. Transvaal Mine Med. Officers Assoc.* 1924. Jan. Vol. 3. No. 9. pp. 1–8. [16 refs.] Also *S. African Med. Rec.* 1924. Mar. 22. Vol. 22. No. 6. pp. 115–122. [16 refs.]

This article deals both with the prophylactic and with the therapeutic use of pneumococcal vaccine. At the outset the author defines his terms, to make it quite clear that his discourse throughout relates to a specific disease, acute lobar pneumonia, due to a specific [or generic] pneumococcus.

In discussing the history of the prophylactic use of pneumococcal vaccine [a history with which the South African Institute and the author's own name are identified] the author first refers to the early failure of WRIGHT, in 1911–12 (before it became known that several different strains of pneumococcus exist) to demonstrate, either by laboratory methods or by empirical tests, any particular immunity-response in the specifically inoculated or infected blood. Subsequent work at the Institute established the facts (1) that about the time of crisis (though not in the early stages of the disease) the patient's blood, in 90 per cent. of cases, contains antibodies (agglutinins and "opsonins") in abundance, and (2) that these antibodies can be evoked experimentally in rabbits and render the vaccinated animals immune, and also in man by suitable vaccine.

Going on to the results of the practical application of this riper knowledge: (1) The Institute having ascertained that 70 per cent. of cases of primary lobar pneumonia among local native miners were due to infection with the pneumococcus-groups A, B or C, 10,866 recruits admitted during a term of 9 months to the "Crown" mines were inoculated with a vaccine containing only these pneumococcus-groups: during that term not one case of pneumonia due to A, B, or C was observed, whereas 82 cases due to other pneumococcus-groups occurred with a case-mortality of 14·63 per cent., and among the "seasoned" natives living on the same mines but outside the "experimental" area the case mortality was 34·7 per cent. (2) During the experimental use of the vaccine for a year (1916–17) the notoriously heavy pneumonia mortality of the "Premier" mine fell to about 1 per 1,000, and of the "De Beers" mines more than 50 per cent. (3) During a term of six years (1917–1922) since the introduction of this vaccination for recruits on the Witwatersrand mines (3 doses at 7 days' interval was the ideal of attainment proposed in 1918) the annual death-rate for pneumonia, which in 1916 had been 5 per 1,000, has only once been 4 per 1,000—in 1917 it was 2·65, and in 1922 it was 1·68 per 1,000—and this notwithstanding the 1918 pandemic of influenza and its aftermath of pulmonary liabilities. The author effectively discounts the argument that these figures can be explained by a general improvement in hygienic circumstances. He refers, next, to work done outside South Africa, particularly to that on monkeys by BLAKE and CECIL and by CECIL and STEFFEN, whose earlier experiments appeared to shake, but whose later experiments, with larger dosage, corroborated his own conclusions. Allowing that improvements are possible, by increasing the dosage, or by adopting the intravenous route, he gives the following account of the vaccine prepared at the South African Institute for Medical Research:—

It "contains 8,000 millions of pneumococci per cc., comprising eight different pneumococcal groups. The method of preparation is as follows:—Cultures of the pneumococcus are grown on four human blood-agar slants. The growths from these slants are inoculated into four one litre bottles of trypsinated bullocks' hearts' broth, the growth of one slant to each one litre bottle. After incubation for about eight hours at 37° C. the contents of these four bottles are used to inseminate 40× 1 litre bottles of similarly prepared broth. These are incubated for six or seven hours at 37° C. The contents of each bottle are then examined microscopically; if the growth is a pure culture and no autolysis has occurred, the broth is run through a Sharples centrifuge. In this machine the cocci are caught in a previously sterilised metal cylinder, from which they are collected and suspended in normal saline; their number is estimated by the opacity method. The suspension is heated to 60° C. for one hour, and allowed to cool again before the addition of 1 per cent. phenol. When this procedure has been applied to the eight different groups of pneumococcus, the vaccine for final use is made by diluting the concentrated suspensions derived from the centrifuge, so that each cc. shall contain 1,000 millions of pneumococci of each of the eight groups, suspended in normal saline containing ·5 per cent. of phenol. This vaccine is then bottled, and a sample taken from each bottle and tested for sterility before the product is issued. The prophylactic dose is 1 cc. to be repeated three times, an interval of five to seven days intervening between the doses."

The author turns to the therapeutic use of the vaccine in a different spirit, as a matter more of opinion than of exact experimental evidence. He speaks of a batch of 40 severe cases treated by himself with intravenous doses of 5 to 20 thousand million pneumococci grown on human blood-agar. The treatment gave the patients some relief, after in most cases a short rigor. The estimated mortality of these cases was 10 per cent. Examination of the blood during the progress of the disease subsequent to the inoculation revealed the presence of antibodies not only against the pneumococcus responsible for the original infection, but also against other pneumococcus groups present in the vaccine. In other experiments the author has found that the antibodies are slow in development, even after very large doses of vaccine by the intravenous route—about 6 days in man. His conclusion from this amount of experiment is rather in favour of the vaccine if it be given very early in the disease and in very large doses.

A. Alcock.

MALONE (R. H.). **A Note on the Types of Pneumococcus found in the Punjab and North-West Frontier Province of India.**—*Indian Jl. Med. Res.* 1924. Jan. Vol. 11. No. 3. pp. 947–949.

The following is the author's summary:—

> "In the Punjab and North-West Frontier Type I pneumococcus is a common causal agent in pneumonia. Types II and III are probably less common than in Europe or America, while 52 per cent. of the cases are caused by strains belonging to the group known as Type IV.
>
> Among the Type IV strains there is one fairly large sub-group which includes 25 per cent. of the strains tested, and another including 9 per cent. The remaining strains were agglutinated only by the homologous sera."

A. A.

LE ROY DES BARRES. **Le Cancer au Tonkin.**—*Rev. Méd. et Hyg. Trop.* 1924. Jan. Vol. 16. No. 1. pp. 5–14. With 2 charts. [8 refs.]

The author, although he gives us some tables of statistics, speaks with considerable emphasis of the worthlessness of medical statistics among native populations of tropical countries. Many there are who agree with him, and will prefer a summary of his general conclusions to a careful analysis of his tables.

The number of cases of malignant disease among natives of Tonkin and Hanoi appears to be increasing and will continue to do so while medical administration goes on extending and improving and more patients come to be examined by European doctors. "Cancer," under which name the author includes carcinomas, sarcomas, and all other malignant growths, is perhaps less frequent in hot than in temperate climates; it is of moderate frequency among the natives of Tonkin and has been observed more often in men than in women. Epithelioma of all varieties occurs, the form in which bird's nest bodies are found being common, the melanotic form rare. Epithelioma of the penis constitutes 16 per cent. of the malignant tumours observed. Cancer of the vulva is perhaps more frequent, that of the mamma much less so than in Europe. Cancer of the uterus is frequent, as also is cancer of the stomach (though nothing like so common as gastric ulcer). Cancer of lips and tongue is rare in Tonkin, but much commoner in Cochin China. Cancer of oesophagus and intestine are very rare, of rectum never yet observed. Primary cancer of liver is frequent in Tonkin. Sarcoma of different types has been observed in muscles, glands, bone, kidney, orbit, and neck. Lymphocytoma of the neck, of a truly malignant character, is quite common.

A. A.

DOLBEY (Robert V.) & MOORO (A. W.). **The Incidence of Cancer in Egypt. An Analysis of 671 Cases.**—*Lancet.* 1924. Mar. 22. pp. 587–590.

The authors have analysed all the cases of malignant disease that have attended the Kasr el Ainy Hospital at Cairo for the last 4 years and give here the results tempered by their own experience. They give them frankly for what they are worth, but, as they say, the records of the greatest hospital of Egypt must have some significance as a criterion for the whole country. Their principal generalizations are as follows :—

In proportion to population, the number of cases of malignant disease is probably less in Egypt than in England. The anatomical distribution of such disease is different. The incidence among the negro element is not different from that of other elements of the population. There is no direct causal connexion between cancer and parasitic diseases. There seems to be no connection between cancer of the tongue and syphilis. Malignant disease of bone, skin, and skin-appendages appears to be more common than in Europe or America. There is a definite relation, " from a negative point of view apparently," between the incidence of cancer and gastric ulcer. There is no probable relation between gall-stones and cancer of the liver (nor is typhoid fever a predisposing factor in the production of gall-stones). The proportional incidence of cancer of the breast is probably the same as in Europe, but chronic interstitial mastitis, which is regarded by some pathologists as a prae-cancerous condition, is practically unknown. The progress of cancer in Egypt is less rapid, the involvement of glands less marked, and metastasis less frequent. There seems to be some definite relation between cancer and diet ; the use of simple vegetable foods and the complete abstinence from alcohol in the country districts seems to be consistent with the non-appearance of cancer of the intestinal tract ; while the use of preserved foods and of alcohol by the Europeanized population of the towns may explain the occurrence there of cancer of the stomach and intestine (as well as of gastric and duodenal ulcer, gall-stones, and appendicitis). The almost complete absence of nerve diseases among the simple fellaheen, their immemorial quietude and incapacity for worry must also have some influence on the incidence and course of cancer in Egypt.

As regards particulars, the following is the record of four years : Cancer of breast, 75 cases ; of lip, 31 ; of tongue, 25 ; of uterus, 25 ; of gall-bladder and vicinity, 10 ; of stomach, 8 ; of rectum, 7 ; of oesophagus, 6 ; of liver, 4 ; epithelioma of scalp, 30. Sarcoma of bones, 98 cases. Malignant disease of bladder, 51 cases; of larynx, 29; of thyroid, 15. Rodent ulcer, 41 cases (commonly of orbit). Cerebral tumour, 11 cases.

A. A.

VAN GAASBEEK (C. B.). **Cancer in St. Croix, Virgin Islands.**—*U.S. Nav. Med. Bull.* 1924. Jan. Vol. 20. No. 1. pp. 31–35.

Between January, 1921, and July, 1923, fourteen authentic cases of cancer occurred in the St. Croix hospitals among 5,720 treated; all epithelioma or carcinoma. The population is 13,500. The author considers this a low rate [no age distribution figures are given], and in seeking to account for this quotes opinions of many authorities, among whom one assigns an important rôle in causation to the action of light and another to the use of soap.

A. G. B.

THOMSON (J. Oscar). **Cervical Lympho-Sarcomas: with an Analysis of Ninety Cases.**—*China Med. Jl.* 1923. Dec. Vol. 37. No. 12. pp. 1001–1010. With 7 figs.

In the region of Canton, of 1,253 tumours within the sphere of the author's operations, 30 per cent. were malignant, 34 per cent. of these being sarcomatous, and 90 per cent. of the last-named being cervical lymphosarcomas.

Cervical lymphosarcoma, which commonly occurs in middle-aged males, usually begins in a single one of the deep-seated glands; it rapidly extends to all the glands of the chain, infiltrates, but is usually movable on the deep structures, and finally may become attached to and ulcerate the skin; the glands of the other side of the neck may become involved and metastases occur in the liver. The rapidity of its growth may be realized by the facts that the individual cells cannot be distinguished and that mitotic figures are numerous. There is some anaemia, but no leucocytosis. If untreated it is fatal in two to three years. Radical excision may cure. Ligation of the main artery of supply relieves symptoms temporarily and may render the tumour suitable for operation.

The tumour is of firm consistence, causes pain, and may cause various symptoms of obstruction and pressure. From lymphadenoma it is differentiated by absence of leucocytosis; from Hodgkin's disease by the absence of general enlargement of the lymphatic glands and spleen; from fibroma by pain and more rapid growth.

A. A.

MOUILLAC. **Note sur une épidémie de scarlatine à Yunnanfou (mars 1921-mai 1922).**—*Bull. Soc. Path. Exot.* 1923. Dec. 12. Vol. 16. No. 10. pp. 760–767.

LAFONT (A.). **A propos d'une épidémie de scarlatine à Yunnanfou.**—*Ibid.* pp. 767–770.

Between March, 1921, and May, 1922, a serious epidemic of scarlatina raged in Yunnan and especially at the capital, Yunnanfu. It is stated to have carried off 50,000, children for the most part, of the 200,000 inhabitants of the town. At first regarded as diphtheria it was treated with large doses of antitoxin, the effect of which seems to have been to suppress the rash. The author on his arrival recognized the disease as scarlatina, and in this diagnosis he was confirmed by LAFONT. Scarlatina had not occurred in Yunnan within the memory of man.

A. G. B.

DAVIES (L. W.). **Two Cases of Scarlatina.**—*Nigeria Ann. Med. & San. Rep. for the Year* 1922. p. 32.

In June a Political Officer at Zaria developed scarlatina, with typical throat and pharynx and tongue signs, enlargement of posterior cervical glands and general rash. The skin desquamated in large flakes. In August, another European Officer at Zaria had a similar attack. The former had received a letter from a schoolmaster in England who had closed his school owing to scarlatina, but had not himself suffered. How the second became infected is quite unknown. The disease is not recognised by the natives.

A. G. B.

SARNELLI (Tommaso). **La malattia del "Lâtah" in Tripolitania.** ["Lâtah" in Tripoli.]—*Giorn. di Med. Milit.* 1924. Feb. 1. Vol. 72. No. 2. pp. 104–106.

The author states that in Tripoli latah subjects exist " in hundreds." He divides the cases into three main groups: Firstly, the " mimetic," whose actions are purely imitative; secondly, the " impulsive," in whom some slight stimulus produces results altogether disproportionate—maniacal speech and actions; thirdly, the " emotive," in whom the sight of a small, harmless animal produces a state of absolute terror. Those affected by the disease are often persons living a quiet life and showing no other indications of mental or nervous instability. Some remain liable to recurrences throughout life; in others the attacks diminish in number and intensity and finally cease altogether.

H. Harold Scott.

VAN LOON (F. H. Gl.). **Lattah, eene psychoneurose der Maleische Rassen.** [Lattah, a Psychoneurosis of the Malay Races.]—*Geneesk. Tijdschr. v. Nederl.-Indië.* 1924. Vol. 64. No. 1. pp. 59–82. [1 ref.]

Founded upon the results of an enquiry in the Dutch East Indies and on personal observation of four cases, the history of which is quoted, van Loon gives his views of the characteristics and the etiology of this imitative neurosis which is common in Malay races especially in women. He does not agree with KRAEPELIN and JELGERSMA, who consider lattah to be an hysteric symptom. The high emotivity, low degree of " secondary function," and low activity, together with the increased suggestibility of the Malay race are the predisposing factors for this typical fright neurosis. The fright causes loss of control and automatic outbreak of the imitative attitude. Often a frightful dream is the first occasion of its manifestation.

W. J. Bais.

LIGNIÈRES (J.). **Nouvelle contribution à l'étude des champignons produisant les actinomycoses.**—*Ann. Parasit. Humaine et Comparée.* Paris. 1924. Jan. Vol. 2. No. 1. pp. 1–25. [3 refs.]

The object of this memoir is to lay the foundations of a rational classification of the Actinomycetes. The memoir consists largely of a detailed study, illustrated by 8 coloured plates, of the individual cultural characters of 4 several strains of *Actinomyces bovis* isolated from 4 cases of classical actinomycosis. Then, while emphasizing the ignorance of the manner in which actinomycosis originates as a pathological condition and the impossibility of producing it experimentally, he insists on the identity of *Actinomyces bovis* with the actinomycetes of wide and general occurrence in Nature. Coming finally to the pathological aspect, he distinguishes in morphological, pathological, and cultural detail, three pathogenic genera, namely, *Actinomyces* Harz, 1877, with *Actinomyces bovis* Harz as type species; *Brevistreptothrix,* a new genus, with *Brevistreptothrix israëli* (Kruse, 1896) as type species; and *Actinobacillus* Lignières, Brumpt, with type species *Actinobacillus Lignieresi* Brumpt, 1910.

A. Alcock.

ARNAUD (L.). **Première relation d'un cas d'Actinomycose Marocaine.** —*Maroc-Médical.* 1923. June 15. No. 18. pp. 178–181. With 2 figs. [1 ref.]

The first case published from Morocco, at all events since 1910. The subject was a woman of 26 who was born at Algiers, had never left Africa, and had lived at Rabat for four years. A swelling at the angle of the jaw for which local treatment was given spread to the neck. It was incised and there was evacuated a little reddish pus containing small pale grains. Under the microscope the characters were those of actinomycosis. An attempt at cultivation failed. Three weeks' treatment with iodide of potassium sufficed for cure. There is no record of actinomycosis in animals in Morocco except at Tangier, where it is fairly common. From the facts that the grains were small and pale and the lesions were subcutaneous and intramuscular rather than bony the author thinks the organism was Cohnistreptothrix rather than Nocardia.

A. G. B.

DICKSON (J. R.); GIDEON (C. S.). **Alastrim.**—*British Guiana Med. Annual for 1923.* pp. 11-14; 14–18.

These are papers presented to the West Indian Medical Conference, British Guiana, 1921.

Dr. Dickson (Trinidad) gives a general description of alastrim, remarking, as do all the clinicians, the slightness of the constitutional disturbance in comparison with the extent of the eruption. He finds that recent vaccination protects, but after the lapse of some years does not lead to a modification of the disease as in smallpox. He refers to young persons with large vaccination scars who were almost covered with the alastrim eruption. He thinks that the likeness to smallpox outweighs the differences and that the cases should be labelled and treated as smallpox.

Dr. Gideon (Jamaica) reported 9,000 cases in that island within the space of 6 months. He describes the symptoms with several references to MOODY's paper (see this *Bulletin*, Vol. 19, p. 438). The consensus of opinion in Jamaica is that recent vaccination confers absolute protection, but neither here nor in the other islands is there a law enforcing re-vaccination. Though alastrim is mild as regards mortality—there were not more than 13 deaths—the disfigurement produced in some cases has been great.

A. G. B.

CHAUVET (Stéphen). **L'alastrim : une nouvelle fièvre éruptive.**—*Rev. Prat. Malad. des Pays Chauds.* 1923. Dec. Year 2. Vol. 3. No. 4. pp. 298–318. With 3 figs.

Cases of alastrim having appeared at French ports where vessels from the West Indies and South America touch, the author gives a very full account of the disease, its symptomatology, diagnosis, treatment and prophylaxis. Though he advises vaccination, he does not appear to regard it as smallpox.

A. G. B.

MUKERJI (B. K.). **A Case of Alastrim (Kaffir Pox).**—*Indian Med. Gaz.* 1924. Feb. Vol. 59. No. 2. pp. 89–90. With 1 fig.

A case of fever and general discrete seropustular eruption (figured) in a Mahomedan boy at Cawnpore, of which few details are given.

A. G. B.

VOMELA (Stanislav). **Die Lyssa im Lichte der Toxinlehre.** [Rabies in the Light of Toxicology.]—46 pp. 1921. Czecho-Slovakia: Im Selbstverlag, Brünn, Pod Tratì 5.

The long argument here sustained is that rabies and tetanus and botulism form a natural group of cognate diseases of the central nervous system—are three species, so to speak, of one pathological genus—differing, *inter se*, only in their symptomatology, which depends on differences in the chemical composition of their several toxins. The main points of the argument are that all three occur as isolated cases, or small local epidemics ; that mammals are particularly susceptible ; that all are produced by a specific toxin, which is formed at a definite point or in a definite tract and invades the central nervous system by way of the peripheral nerves ; that none of them produces any definite and characteristic pathological lesions, but that all are made manifest by characteristic effects upon the grey matter, preferentially of the motor ganglia, of the nerve centres. Of course, it is recognised that in the case of tetanus and of botulism the toxin is produced by a specific bacillus and that the origin of the virus of rabies is uncertain.

A. A.

REMLINGER (P.). **Différence d'action de la glycérine à l'égard du virus rabique de rue et du virus fixe.**—*C. R. Soc. Biol.* 1923. Dec. 8. Vol. 89. No. 35. pp. 1132–1133.

Recently-dried cords (2 or 3 days) of rabbits dead of fixed virus kept in contact with glycerine for 7 or 8 days lose their virulence (in the case of street virus, in the same circumstances, they do not lose their virulence until 20 or 21 days).

A. A.

METCALFE (A. J.). **The Schick Test at Thursday Island.**—*Med. Jl. Australia.* 1924. Feb. 2. Year 11. Vol. 1. No. 5. pp. 111–112. [7 refs.]

The population of Thursday Island in Torres Straits is about 1,400, including 400 whites. Though there is constant communication with Australia and with China and Japan, and the records go back to 1883, there are few reports of diphtheria. It was thought probable that all the children were non-immune and that the introduction of a case might lead to grave results. A series of Schick tests, with the parents' permission, was therefore carried out. The results were noted after 24, 48 and 72 hours, 7 and 14 days; a pseudo-reaction which occurred in 15 per cent. is an early phenomenon. Of 156 children of ages 4–15 tested 151 gave the reaction, and 5 did not, a positive percentage of 96·8. It would appear that the number of susceptible children in a community depends to a large extent upon the opportunities they have had to develop immunity.

A. G. B.

MONTEL (L. R.), TRÂN VAN AN & DANG VAN CÚÓNG. **Adénopathies iliaques primitives chez des Annamites de Cochinchine. Guérison par le chlorhydrate d'émétine.**—*Bull. Soc. Path. Exot.* 1924. Jan. 9. Vol. 17. No. 1. pp. 67-75. With 3 figs.

In this paper abstracts are given of ten cases, observed among natives of Annam, in which there occurred in the right iliac region a tumour of considerable size, not excruciatingly painful and without concomitant high fever or other symptoms of peritonitis, and therefore not due to appendicitis. In four of the cases there was evidence or a history of dysentery, and in two there was diarrhoea. Of six cases that stayed for treatment all were benefited by emetine, alone or in concurrence with novarsenobenzol; indeed, in two cases the tumour completely disappeared after the third and the fourth injection of emetine (10 cgm.). The authors attribute these tumours to a definite lymphadenitis following typhlo-colitis or recto-colitis of amoebic origin.

[The condition here described may be considered in comparison with the invading hyperplasia of the intestinal submucosa--reminiscent of a neoplasm--described by CHATTON (see this *Bulletin*, Vol. 19, p. 27) in the experimental amoebiasis of guineapigs; and more particularly with the tumour in the right iliac fossa described and discussed in its possible association with *Entamoebia histolytica*, by FINOCHIETTO and VACCAREZZA (*Ibid.*, p. 28).]

A. A.

STEVENEL. **Contribution à l'étude des Pyomyosites observées à la Côte d'Ivoire. Action thérapeutique de l'iodure de potassium.**—*Bull. Soc. Path. Exot.* 1923. Dec. 12. Vol. 16. No. 10. pp. 710–712.

Pyomyositis is fairly common at Bouaké. Cases were seen from the end of February till August, a little after the beginning of the rainy season. The muscle abscesses are sometimes multiple and often develop without constitutional disturbance, frequently without fever and with no tendency to open on the skin surface. Sloughing and purulent infiltration are not uncommon. They tend to appear in succession in various parts of the body. When pus is let out it is greyish, viscous and mixed with blood. Microscopical examination shows it to contain isolated clumps of motionless micrococci of sizes varying in the same clump from less than half to more than a micron, and staining irregularly. Haricot forms are seen, in pairs or tetrads.

A thick and irregular capsule is generally to be made out. The organism grows well on all the ordinary media. The micrococcus is classed in the Tetragenus group with the peculiarity that it grows best about 28° C. on media containing glucose and begins to clot milk in fine coagula after 5 days at the same temperature. Broth becomes clouded uniformly. Gelatine is not liquefied and stale cultures give a series of colonies equally dense in the depth and towards the surface. A guineapig inoculated from a culture showed swelling of the neighbouring muscles after 3 days, and on the 5th day fluctuation and on the 9th an abscess burst with thick viscous pus, containing cocci in tetrads with an irregular capsule. On the 12th the animal had recovered. A case in a European is recorded in which fluid withdrawn by a syringe before fluctuation contained similar organisms. The effect on the patient of pot. iod. in increasing doses up to 12 gm. daily is astonishing. Small abscesses dry up and larger ones heal if punctured with a trocar.

A. G. B.

BRAHMACHARI (Bepin Behari). **Epidemic Dropsy, is it not an Infection ?** —*Calcutta Med. Jl.* 1923. Dec. Vol. 18. No. 6. pp. 519–533. With 2 maps & 1 chart.

Two epidemics were studied, at Krishnagar in 1919–20 and in villages of the Khulna and Jessore districts in 1922. Of 127 Krishnagar cases all suffered from anaemia, oedema and weakness, 29 had in addition diarrhoea, 28 diarrhoea and fever, and 40 had nervous symptoms consisting chiefly in burning sensations in the soles and palms; in 68 per cent. therefore there was no implication of the nerves. 70 per cent. in all had pronounced gastro-intestinal symptoms; 39 per cent. fever, as a rule ranging between 99° and 101° F.; oedema, an invariable symptom, was limited as a rule to feet and legs. There were 4 deaths. Whereas in the Calcutta epidemic GREIG found the disease limited to the small clerk class with fixed incomes, at Krishnagar it affected " the élite and the rich " besides the jail, college hostel and school. Much of the paper is given to a discussion of malnutrition, food poisoning and infection as possible causes. Defective diet is ruled out. Mineral oil as an adulteration of mustard oil and a toxamine in rice are considered, but the author evidently leans to infection and gives some suggestive accounts of the spread of the disease from house to house.

A. G. B.

PONS (R.). i. **Organisme spiralé mobile isolé en hémoculture au cours d'une fièvre à caractère récurrent.**—*C. R. Soc. Biol.* 1923. Nov. 24. Vol. 89. No. 33. pp. 1028–1030.

——. ii **Sur la nature d'un germe spiralé isolé en hémoculture au cours d'une maladie fébrile à caractère récurrent.**—*Ibid.* 1924. Feb. 22. Vol. 90. No. 6. pp. 396–398.

i. From Saigon. The patient, a male of 22 years, had travelled in Egypt and China. The clinical symptoms resembled those of relapsing fever; recovery occurred after one relapse. Organisms appeared in blood cultures on the 14th day. They appeared under three forms: (*a*) vibrioids 3–8 μ long and 0·3–1 μ broad, with 2 or 3 loose spirals and very mobile; (*b*) spirillar forms 15–25 μ long, with 4–6 sharper spirals and progressive undulatory movement; (*c*) elongate forms of 100 μ, showing the ordinary non-progressive undulations. In eight-day old cultures stained by Tribondeau's method certain individuals displayed a granule, or granules, of diameter apparently greater than the organism itself, and more basophilic; and also free spherical bodies of 1–3 μ diameter were seen, singly or in small groups. Cultures in NNN medium lived 15 to 20 days, at 37° C. The organism multiplies by binary or multiple transverse fission, and grows under ordinary conditions as well as anaerobically.

ii. In preparations it has the classical spirochaete form, but shows in culture every gradation from a short non-flagellate rod, through a vibrion form, to a short spiral-form. Though it has rapid movements both of undulation and locomotion the body appears rigid. For culture blood-albumins are necessary, the optimum temperature is 28° C., and anaeroby is favourable but not essential; cultures have no odour. In old cultures coccoid bodies both internal and free may be seen. Spiral forms may be grown in subcultures of cultures from which spiral forms have long disappeared. Experimentally this microbe is very infective and pathogenic to guineapig, rabbit, and monkey. Inoculated by any route the blood becomes infective from the 2nd day and gives positive blood-cultures in 3–4 weeks. Fever, which starts on the 2nd or 3rd day, is the most constant symptom, and is recurrent if the illness is prolonged. In the rabbit subcutaneous inoculation has caused a destructive irido-choroiditis, and intra-testicular inoculation a voluminous orchitis. In the guineapig, infection is often fatal on the 3rd–10th day, and the visceral lesions consist of slight sanguineous effusions and sometimes slight enlargement of the axillar and inguinal glands. Some of the animals recovered from the infection appear to be immune. Novarsenobenzol has a remarkably specific action both therapeutically and on cultures; a dose of 0·01 gm. per kilo of bodyweight sterilizes the blood of an animal in 48 hours; in cultures growth is stopped by dilutions of 1 in 250,000.

A. A.

PHIPSON (E. S.). **Observations on an Outbreak of Typhus in Simla with Special Reference to the Weil-Felix Reaction.**—*Indian Jl. Med. Res.* 1923. July. Vol. 11. No. 1. pp. 305–318. With 3 charts. [10 refs.]

——. **A Note on the Serological Diagnosis of Typhus by the Weil-Felix Reaction.**—*Indian Med. Gaz.* 1924. Jan. Vol. 59. No. 1. pp. 7–11. With 6 charts.

The summary and conclusions give an adequate account of this paper:—

" (1) The Simla outbreak consisted of 16 cases (8 males and 8 females) restricted to a single Mohammedan family and attended with a case mortality of 37·5 per cent.

" (2) The origin of the outbreak is not certainly known, but the available evidence points to the virus having been introduced by a healthy third party from a focus of infection 25 miles away, the medium of transmission being, presumably, infected lice.

" (3) The existence of the epidemic was not recognised until several deaths had occurred, and the clue to its existence was afforded by the application of the Weil-Felix reaction to the sera of two *recovered* cases.

"(4) The sera of 12 cases known or suspected to be suffering or to have suffered from Typhus were tested for agglutination by Garrow's method against *B. proteus* X 19 in every case with a positive result, varying according to the stage of the disease from 1 : 16 to 1 : 2048, with one exception, an almost moribund case, which was only tested once and reacted in no higher dilution that 1 : 4.

"(5) The sera from 100 healthy subjects, chiefly Indians specially selected as likely to provide the most exacting controls, were tested for agglutination against *B. proteus* X 19 with the result that all failed to show the least trace of agglutination in a dilution of 1 : 16; 8 per cent. gave a feeble reaction in 1 : 8, 33 per cent. reacted in 1 : 4, and 59 per cent. failed to react in 1 : 4.

"Conclusions.—(1) The Weil-Felix reaction in Indians is of value—

"(*a*) in confirming a diagnosis arrived at by clinical observation;

"(*b*) in establishing a diagnosis in atypical cases in which the clinical evidence of typhus is doubtful;

"(*c*) in arriving at a retrospective diagnosis in cases which have recovered, provided the interval since recovery is not too great.

"(2) There are some grounds for the belief that the Weil-Felix reaction may prove to possess, as far as Indians are concerned, a more nearly specific character than has hitherto been assigned to it, with correspondingly enhanced value as a diagnostic method."

The agglutinating organism was received from Dr. MANSON-BAHR and came from the Civil Laboratory at Jerusalem. Charts show the type of the fever and demonstrate the high frequency of the pulse. The rash was made out in 6 cases carefully observed, it was best seen as discrete macules on the inner sides of the arms and was well displayed by the application of oil to the skin surface.

A. G. B.

SMITS (J. C. J. C.). **Miltabscessen.** [Abscesses of the Spleen.]—*Geneesk. Tijdschr. v. Nederl.-Indië.* 1923. Vol. 63. No. 5. pp. 685–708.

A full account of the pathologic, clinical and surgical aspects of splenic abscess, 6 cases of which disease are quoted. The causes were respectively: endocarditis, typhoid fever, puerperal and other sepsis, perinephritis, and amoebiasis. Complicating purulent pleurisy was common and as a rule does not render the prognosis of the case worse. Primary abscess of the spleen is considered to be very rare if it exists at all. Surgical treatment is discussed in detail.

W. J. Bais.

MANSON-BAHR (Philip) & GILL (G. Brittan). **On a Case of Lymphadenoma with Relapsing Pyrexia of Tropical Origin (the Pel-Ebstein Syndrome).**—*Trans. Roy. Soc. Trop. Med. & Hyg.* 1923. Oct. 18. Vol. 17. No. 4. pp. 246–254. With 1 chart & 1 fig. [11 refs.]

The case described is one of lymphadenoma with recurrent pyrexia without enlargement of the superficial glands, and it is of interest to tropical workers because it began when the subject, a man of 26, was in Egypt. In 1912 only eight such cases had been recorded. The whole course of the disease in this case was 2¼ years. The chart suggests a spirochaetal infection; periods of pyrexia lasting 7–8 days are separated by rather longer intervals in which the temperature is subnormal. In an attack observed at Leicester there was painful enlargement of the spleen, adenitis of the glands of the groins and a leucocytosis of 12,600; jaundice also is observed. The blood, repeatedly examined, never showed any characteristic change; blood cultures and animal inoculation were negative. Death took place at the end of a pyrexial attack in the Tropical Diseases Hospital. Postmortem the liver and spleen were enlarged, the spleen mottled by tiny pale infarcts resembling multiple tubercular deposits. The mediastinal and other internal glands were swollen to the size of a walnut. The difficulty of diagnosis is obvious. Apart from the absence of parasites the intervals between the attacks are longer than is usually the case in other forms of relapsing fever.

A. G. B.

CLARKE (J. Tertius). **The Treatment of Erythro-Melalgia Tropica by Injections of Antimony.**—*Jl. Trop. Med. & Hyg.* 1923. Sept. 15. Vol. 26. No. 18. pp. 285–286.

Among the South Indian agricultural labourers in the Malay Peninsula, not among the Chinese or Malays, is seen an affection called " burning pain in the feet," of which the author has seen 30 cases in 18 months. The patient walks on his heels and the outer side of the feet. The pain is severe, mostly in the sole, and prevents sleep. It lasts 3–4 months or even a year; it is always symmetrical. Examination reveals nothing. The author looks upon it as a manifestation of ankylostomiasis [but does not say whether and to what extent his patients were infested]. He injects into the gluteus one grain of tartar emetic in 20 minims of water once a week and has thus cured most of his cases. A smaller dose was ineffectual or was followed by relapse.

A. G. B.

MONSERRAT (Carlos). [In English & Spanish.] **Bacteriological and Pathological Study of a Case of Anthrax Septicemia with Gastro-Intestinal Lesions. Estudio bacteriologico y anatomo-patologico sobre un caso de septicemia producido por el bacilo del antrax con lesiones en el estomago y en el intestino.**—*Jl. Philippine Islands Med. Assoc.* 1923. July-Aug. Vol. 3. No. 4. In English pp. 193–198. With 6 figs. [8 refs.] In Spanish pp. 220–224.

In this case, believed to be the first reported from man in the Philippines, the disease was acquired through the digestive tract. After a few days of fever, profuse nasal discharge, and later, prostration, the patient, a Filipino, was admitted to hospital where he died shortly, without gastro-intestinal symptoms, his case undiagnosed. Besides other lesions, nodules, in some cases ulcerated, were found in the small intestine and anthrax bacilli were isolated from the blood. The post-mortem appearances, microscopic and naked-eye, are described in some detail.

A. G. B.

MAXWELL (J. Preston). **Osteomalacia in China.**—*China Med. Jl.* 1923. Aug. Vol. 37. No. 8. pp. 625–642. With a map & 14 figs. [17 refs.]

Osteomalacia occurs in China in several high-lying areas north of the Yellow River, including the whole of Manchuria, where, however, the type is mild. At Ping-ting-chow in Shansi, with a population of 15,000, it is believed that one in fifty of women at the child-bearing period has the disease and in Shensi one to five per cent. of such women are affected. The only known focus south of the Yellow River is near Changsha in Hunan, where the trouble is chest deformity. The disease is known as " Yao t'ui t'eng " or " back and thigh pain." The bones affected are the pelvic, thoracic and long bones, sometimes one group, sometimes another and there are characteristic deformities, those of the pelvis disabling the patient from normal child-bearing and from marital relations. The muscles become weak and tetany is common. The disease begins with puberty or with pregnancy or with lactation ; in each instance the calcium balance is upset. The etiology is discussed but is not elucidated. Diet and environment may play a part. It is the middle classes, rather than the poor or the rich, who are affected, suggesting that confinement to the house with an inadequate diet disposes to the disease. The author believes that if the standard of living as regards food and exercise could be raised the disease would disappear. A similar condition has been seen in goats. .[See also this *Bulletin,* Vol. 18, p. 298.]

A. G. B.

VAMPRÉ (Enjolras). **Terceira contribuição ao estudo do " mal de engasgo."**—*Brazil Medico.* 1923. Sept. 1 & 8. Year 37. Vol. 2. Nos. 9 & 10. pp. 137–144. With 4 figs. ; 158–166.

"Mal de engasgo" or the "choking disease" is a peculiar condition occurring chiefly in males between the ages of 20 and 30 years, affecting at times several members of a family, making its first appearance suddenly, perhaps after exertion, and showing intermissions of varied duration from a few hours to months and even years. Among the names by which it has been described are : spasmodic dysphagia, oesophagismus, cardio-spasm. During the attack vomiting, or, more correctly, regurgitation, is frequent ; there is no pain, but a sense of suffocation which is only relieved by inducing regurgitation of food. As a result of the malnutrition wasting may be extreme.

The case is recorded of a man, 62 years of age, who had suffered intermittently from this condition for 10 years. Operative measures were decided upon. On opening the abdomen a narrowing of the oesophagus was seen over 4–5 cm. of its length starting 2 cm. above the opening into the stomach. The oesophagus was dilated above the stricture. Operation consisted of dividing the circular muscle fibres down to the mucosa ; no sutures were used. For three days no food was allowed by mouth, then warm fluids were given and the food gradually increased until, 15 days after the operation, the patient was taking mingao (a sort of paste made of flour of Mandioca, sugar and eggs), soups, milk, fruit, etc. Relief was immediate and there has been no recurrence [unfortunately no dates are mentioned].

The second part of the paper consists of an historical résumé of the various theories which have been advanced from time to time to explain this condition, notably the following : (*a*) Primary cardio-spasm (MELTZER & MIKULICZ), (*b*) Primary atony of oesophagus (ROSENHEIM), (*c*) Congenital predisposition (FLENIER, ZENKER & SIEVERS), (*d*) Torsion of the oesophageal opening, (*e*) Constriction secondary to ulcer of stomach or oesophagus, simple or malignant. The author, however, believes that the dilatation is a mechanical secondary effect of the constriction which is itself due to oesophageal contracture of parasitic origin. He adduces for this the peculiar distribution of the disease in Brazil, its epidemic character, and the presence in each case of an enlarged spleen. [The last is not a point of much weight, since, he states, in an experience of 40 years he has never met with a case which had not previously suffered from ague.]

For earlier accounts of mal de engasgo see this *Bulletin*, Vol. 2, p. 109; Vol. 18, p. 301.

H. Harold Scott.

CALBAIRAC. **Essai de vaccinations antiméningococciques sur un contingent annamite.**—*Bull. Soc. Path. Exot.* 1923. Dec. 12. Vol. 16. No. 10. pp. 712–715.

LAFONT (A.). **A propos d'un essai de vaccination antiméningococcique au Tonkin.**—*Ibid.* pp. 715–717.

In consequence of an epidemic of cerebrospinal meningitis in a garrison town in French Indo-China which had killed 13 out of 18 Annamites attacked, the rest were inoculated with vaccine from Saigon and Haiphong. In a preliminary test 20 men from an unaffected unit and 30 from an affected were inoculated, after in the second case a previous injection of 3 cc. of antimeningococcic serum. Both groups received 1 cc. of vaccine and 5–6 days later 2 cc. No reaction occurred, and the rest were then treated with the double dose of vaccine, which contained a milliard of germs to the cc. Six had reactions, in only one case fatal. There were no more cases of meningitis. Five severe cases of the disease were treated with vaccine with recovery in three.

Lafont says that the object was to immunize these men rapidly because they had to proceed to France. Among 250 who did so proceed there was no case during the 30 days of passage. He thinks that three of Calbairac's six cases were incubating the disease at the time of vaccination; they were treated with antimeningococcic serum and recovered. He concludes that prophylactic inoculation should be put in practice. As to the cases treated he reserves his opinion, but he remarks that often in bacterial diseases when serum fails an autovaccine, or even a stock vaccine, may lead to remarkable recovery, even when the patient's life was despaired of.

A. G. B.

LALUNG-BONNAIRE & PONS (R.). **Encéphalite léthargique en Cochinchine.**—*Bull. Soc. Path. Exot.* 1923. June 13. Vol. 16. No. 6. pp. 399–403.

Between November 1922 and February 1923 the authors have seen at Cholon, Cochinchina, 5 cases of lethargic encephalitis which they have studied at the Saigon Pasteur Institute. A short account of each is given and of experiments on rabbits. Starting from an emulsion of brain it was found possible to infect this animal, in the proportion of 1 in 3, with an affection, both general and local, which could be transmitted in passage and had the character of experimental encephalitis. The duration of the infection in the course of passage came down to a minimum of 6 days, which may prove to be the result of fixation of the virus.

A. G. B.

FRANCIS (Edward). **Tularaemia. IX. Tularaemia in the Washington (D.C.) Market. X. The Amino-Acid Cystine in the Cultivation of** *Bacterium tularense.*—*Public Health Rep.* 1923. June 22. Vol. 38. No. 25. pp. 1391–1404. [6 refs.]

IX. Some interesting facts relative to the spread of tularaemia are here recorded. Infected rabbits are sold in the market places, which may be far distant from the original source of infection, and retail sellers and buyers as well as cooks, etc., are known to have acquired the disease in this way. The distribution of the disease may thus be studied by a survey of markets, and the best months are November, December and January, when the game laws are in abeyance and the supply of rabbits is particularly plentiful. The disease is now known to extend right across America, from California to North Carolina and Washington.

X. Cystine and cysteine hydrochloride are the only two of the numerous chemicals studied by the author that render fresh beef-infusion peptone-agar favourable for the prolonged cultivation of *Bacterium tularense.* Media containing yolk of egg, or rabbit blood, or fresh spleen of rabbit or guineapig are favourable for the cultivation of *B. tularense.* The three media of the author's election for all laboratory and serological work connected with the isolation and cultivation of the organism are the following:—

" 1. *Serum glucose cystine agar.*—Fresh beef infusion agar, containing 1 per cent. peptone, 1 per cent. agar, and 0·5 per cent. sodium chloride, adjusted to a reaction having a pH of 7·3, is kept on hand in stock. When needed, there is added to the stock agar 0·1 per cent. of cystine and 1 per cent. glucose, and this is heated in the water-bath sufficiently long to melt the agar and to sterilize the cystine and glucose, after which it is cooled to 50° C., when 5 per cent. horse serum is added. The medium is then tubed, slanted, and incubated 24 hours to insure sterility.

" 2. *Serum glucose cysteine hydrochloride agar.*—This is the same as (1) except that cysteine hydrochloride is substituted for cystine.

" 3. *Glucose cysteine hydrochloride agar.*—This is the same as (2) except that no serum is added.

" In medium (1) the pH of 7·3 is unchanged by the addition of cystine, while in mediums (2) and (3) the pH of 7·3 is changed to 6·8 by the addition of cysteine hydrochloride. *Bacterium tularense* grows equally well throughout the range from 7·3 to 6·8."

A. A.

CLARK (Herbert C.). **Sinusitis, Otitis Media and Mastoiditis—the Incidence at Autopsy in the Panama Canal Zone.**—*Proc. Med. Assoc. Isthm. Canal Zone.* 1920. Jan.-Dec. Vol. 13. Pts. 1 & 2. pp. 66–74.

The author analyses 3,376 autopsies in which he has opened and inspected the accessory divisions of the head through the floor of the anterior and middle fossae of the skull and presents the results in a series of nine tables with a commentary. He points out that the population of the Panama Canal Zone is very largely formed of young male West Indian negroes and men of mixed race from Latin America. The figures show that otitis media and mastoiditis was found in 6·7 per cent., sinusitis (children included) in 7·37 per cent., and that 12·33 per cent. showed more than one of these lesions. Whereas sinusitis was most common in the 3rd decade, the chief incidence of otitis media and mastoiditis was in the first 3 years. The incidence in whites was 6 per cent., in negroes 11·37, and in Latin-American mestizos 22·5 per cent. These last are very susceptible to respiratory diseases and their sequelae. 413 cases in all had a suppurative lesion in some one or more of the accessory cavities of the skull and in 51 the three conditions coexisted. A chart giving the diseases associated with the lesions shows that all the 24 influenza cases were affected, 22·5 per cent. of the pneumonias and 5·4 per cent. of the lung tuberculosis cases. Cases of sudden death (189) showed these lesions in 3·17 per cent., which must be the average for the general population. Among the numerous details in a closely packed paper one more may be selected for mention. Among the 413 cases with suppurative sinusitis and otitis media there were but 24 cases recognised by the physician.

A. G. B.

BESREDKA (A.). **Local Immunity in Infectious Diseases.**—*Trans. Roy. Soc. Trop. Med. & Hyg.* 1923, Dec. 13, & 1924, Jan. 17. Vol. 17. Nos. 6 & 7. pp. 346–356. (Discussion 356–368.)

The theme of this interesting discourse is that where certain tissues are peculiarly susceptible to certain bacteria corresponding immunities can be directly acquired by such tissues irrespective of any leucocyte defence, the main argument being supplied by a consideration of the process of directly immunizing the gastro-intestinal tract by vaccines directly applied by ingestion *per os.*

The novel idea of a local tissue-immunity is in the author's opinion realized in his recent studies of anthrax in the guineapig. It was long believed that this animal was so exceedingly sensitive to the anthrax bacillus as to be intractable to vaccination by any of the usual methods even with the most attenuated virus. The author, however, has observed, on the one hand, that if in the process of inoculation the skin of the animal be scrupulously respected the virus may be injected into almost any other situation with impunity to the animal, and, on the other hand, that if the vaccine (or virus) be applied to the skin direct the animal can be immunized to overwhelmingly lethal doses, and this without the necessary appearance of any antibodies. (A similar pure "skin" immunity to staphylococcus and to streptococcus also can be produced in guineapigs within 24 hours and without the intervention of antibodies, by applying a dressing soaked in a vaccine or in the filtrate of an old culture of these bacteria to the animal's abdomen.)

Being satisfied, therefore, that in the case of the guineapig and anthrax the susceptibility and the defensive reaction to infection are properties of a particular tissue—the skin, the author translated his observations to the intestinal tract and there discovered instances of the same phenomenon in dysentery, enteric, and cholera. Experiments with rabbits impressed him with the special affinity of these pathogenic bacteria for the intestinal wall; wheresoever into the body they are injected, the only part that reacts to them is the intestine, and there they often appear in a pure culture. Such being the selective sphere of action of the bacilli, is it also the elective site for vaccination (*per os*)? In the case of dysentery, experiments upon rabbits (and mice) are said by the author to be convincingly affirmative; ingestion of heated cultures imparts solid immunity, and this has been corroborated for man by NICOLLE (this *Bulletin,* Vol. 20, p. 115) and also by some field experiments here recorded:—In an epidemic (Shiga) at Versailles 546 out of 1,616 soldiers were vaccinated by mouth; of the 546 forty-two (7·69 per cent.) developed dysentery during 16 days following ingestion; of the 1,070 not vaccinated 287 (28·6 per cent.) contracted dysentery, with 5 deaths. At Petrograd 1,000 out of 2,768 persons ingested vaccine in an epidemic that continued for a month afterwards; among the 1,000 there were 9 cases of dysentery, 6 of which may be excluded as having occurred almost immediately after the vaccination; among the 1,768 not vaccinated there were 56 cases.

In dealing with typhoid and cholera (where the endotoxins are much less active than in dysentery) experiments on rabbits are at first obstructed by the fact that the normal intestine of this animal is indifferent to these bacilli when ingested. If, however, the intestine be cleaned by a preliminary purgation with oxbile it becomes remarkably sensitive (in the same way that the scarified skin of the guineapig is sensitive to anthrax) and equally receptive—independently of the production of antibodies—to an immunizing vaccine. Mouth vaccination against typhoid has produced some arresting results in man also (see this *Bulletin*).

Having satisfied himself by experiment that susceptibility and acquisition of immunity to dysentery and typhoid and cholera come within the same generalization as susceptibility and acquisition of immunity (of the guineapig) to anthrax, the author inquires further whether this direct immunization of a specifically receptive tissue is essentially different from immunization imparted by the indirect subcutaneous route. Taking cholera as the example, he opposes the statement that the establishment of immunity is effected differently, by antibodies. That statement has been held to be conclusively proved by the fact that after subcutaneous vaccination immunity is not established for 5 or 6 days, and that its establishment synchronizes with the appearance of antibodies in the blood. The author, however, regards this synchrony as a mere coincidence, since in the guineapig immunity can be produced within 24 hours by subcutaneous or intravenous injection of the filtrate of a broth culture of cholera vibrios which has been incubated at bloodheat for 10 to 20 days—even if it be heated to 100°–120° C.; the immunity in this experiment must be something independent of leucocytes.

Finally the author discusses the mechanism of immunity without intervention of antibodies, but produces merely the verbal explanation —not up to the level of the rest of the discourse—that it appears to depend upon "the desensitization of the receptive cells."

In the discussion of the paper Dr. **Ledingham** impugned the originality of Besredka's observations on the guineapig; stated that anthrax bacilli injected under the skin of a susceptible animal without contamination of the skin were destroyed by phagocytes and perhaps by anthracidal bodies in the plasma; quoted **Holman** and **Fernish** to the effect that guineapigs infected with anthrax by scarification succumbed without any trace of reaction locally, and when merely exposed (with a scarified skin) to anthrax-contaminated material showed no susceptibility to infection at all; referred to experiments by **Zingher** and **Soletsky** in which attempts to produce immunity to paratyphoid by mouth vaccination were a complete failure, and also to experiments with mouth administration of Shiga vaccine by **Kanai**, in which a very low form of immunity was demonstrated and agglutinins were observed; and also referred to experiments by himself and others demonstrating an immediate (though transitory) increase of opsonic power in guineapigs receiving injections of autolysed staphylococcus cultures and such substances as nuclein. **Ledingham** also depreciated the field statistics.

To LEDINGHAM's objection Dr. PLOTZ, who delivered Besredka's paper, replied that he imagined Besredka's positive proof that the skin was the organ exclusively susceptible to anthrax invasion in guineapigs was original both in itself and in its present implications ; that anthrax bacilli injected under the sequestered integuments of a susceptible animal remained alive for some hours, and that anthracidal serum and anthrax resistance were not convertible propositions ; that direct skin infection in guineapigs produced an extensive local reaction ; and that the failure of ZINGHER and SOLETSKY was probably due to technique, and the imperfection of KANAI's results inexplicable in the teeth of those of NICOLLE.

Colonel HARVEY also criticized the statistics. He mentioned as a significant contribution to the general line of argument that FIRTH long ago noticed that dysentery bacilli can be neutralized by emulsion with intestinal tissue of rabbit, but not with brain, spleen, liver, or muscle.

Dr. TEALE had followed Besredka's indications but had failed to infect the intestine. In his experience " the mucosa of the whole length of the alimentary canal is a large excretory organ " from which bacteria inoculated anywhere in the body are excreted. He doubts that infection of an animal can be produced by oral administration of bacteria unless huge amounts are given, and even then the route of infection would be through the bucco-pharyngeal mucosa into the neighbouring glands. [This proposition, so strangely inconsistent with sanitary doctrine and with some of the principal items of sanitary administration, is, no doubt, meant to be taken with qualifications not then precisely expressed.] He had also been unable to prevent the infection of animals into which anthrax bacilli had been injected with special consideration for the integrity of the skin. To these objections Dr. PLOTZ replied in the sense that they did not accord with Besredka's and his own experience.

PLOTZ finally contributed an independent epilogue on the relation of antibodies to immunity :—

Antibodies can be demonstrated in the serum of guineapigs and rabbits after intraperitoneal or intravenous or subcutaneous inoculation with large doses of killed anthrax bacilli, yet the inoculated animals cannot resist even a minimal lethal dose of virus ; if living cultures in large doses be injected intraperitoneally or subcutaneously antibodies may be developed, but there is no immunity ; immunity to anthrax in experimental animals can be brought about only by immunizing the skin, and it may be of a very high degree and without attendant antibodies in the serum. Furthermore, as is shown in particular detail in a table, bile-sensitized rabbits fed on typhoid bacilli may develop a high agglutinin content without immunity, or, conversely, a high degree of immunity without agglutinins.

A. A.

POPE (William J.). **Synthetic Therapeutic Agents.**—*Brit. Med. Jl.* 1924. Mar. 8. pp. 413–414.

The routine of the quest for synthetic therapeutic agents is now well understood ; its methods are exemplified and justified in the discovery of the organic compounds of the heavier metals so useful in the treatment of trypanosomiasis, spirochaetosis, and other protozoal diseases. The element that in its simpler combinations is known to be therapeutically active being selected, the organic chemists prepare an extensive series of closely related organic compounds of that element, the effects of these organic compounds upon living organisms and physiological fluids are then individually investigated in the pharmacological laboratory, and such of them as show safe promise are then tested by the clinicians. This method of close collaboration of organic chemist, pharmacologist, and clinician is the method now pursued, in a spirit in which "little of the altruism of pure science is discernible," in Germany. In England anything like this co-operative method does not exist. We have competent chemists who, it is safe to assert, would very soon produce—as the French chemists are said to have already done—a substance identical with "Bayer 205" in physical and trypanocidal properties, or perhaps something therapeutically better, if only they could work in continuous collaboration with some such body as the Medical Research Council. Or, an Advisory Committee, including representatives of all the necessary interests, might be formed, whose business would be to draw up select plans of work embracing the preparation of long series of organic compounds, and the pharmacological and clinical investigation of such of them as gave promise of useful therapeutic application; the first item of the programme would necessitate the employment of a number of chemists under the direction of the Committee, but the expense incurred would be amply repaid by the results obtained.

A. A.

Ross (Ronald). **The Management of Medical Research.**—*Jl. Trop. Med. & Hyg.* 1924. Jan. 1. Vol. 27. No. 1. pp. 1–6.

In his stimulating, if discursive, treatment of this subject Sir Ronald Ross deals not with any technical detail of administration and manipulation, but with the conduct of medical research as a matter of public policy and principle. Is research in medicine to be, as the idealists importune, a distinct craft and livelihood, with its own appointed apparatus and livery and indentures, broad-based upon the public purse? Or is it to be left—where the Muse of History seems to have left it—to the supreme voluntary individual based on nothing more than his gifts of nature and good fortune? This is the controversy between what Sir Ronald Ross, in stock-exchange metaphor, styles "bulls" and "bears."

Sir Ronald Ross—like Sir Roger de Coverley in another controversy—concludes that there is much to be said on both sides. He sees that a body of paid and well-equipped investigators will at any rate collect and classify an extensive mass of observation and fact; therefore he does "not agree with the party of the 'bears' when they deprecate subsidized investigations carried on by full-time workers under managing committees." On the other hand, he very fully appreciates the argument that many of the farthest-reaching discoveries in medicine have been made by men whose only support was by the practice of their profession and whose only laboratories were their wards and consulting-rooms; some of them suffered pecuniary damage by their devotion to science; "therefore the whole field of public support for science should be broadened so as to include such men," and "we should pay not only for expectations but for results."

A. A.

Valderrana (Pinto). **La Colombie.**—*Presse Méd.* 1924. Mar. 19. Vol. 32. No. 23. (Supplément.) pp. 469–477. With 11 figs.

The prologue tells of the superlative natural resources of Colombia—its exuberant soil, its mineral wealth, and its wonderful flora, and of the range and diversity of its climates, from the torrid riverine plains and valleys, through ascending temperate regions, to the cool and even frigid heights of the magnificent Cordilleras. The torrid zone (up to about 2,000 feet) includes much impenetrable jungle, but here are also found cinchona, ipecacuanha, sarsaparilla, vanilla, tolu, and rubber, and, under cultivation, rice, sugar, cotton, and tobacco ; its population is an intermixture of coloured races with a considerable leaven of the Caucasian. In the temperate zones (about 2,000 to about 6,500 feet) besides the giant forest primeval with its marvellous orchids and lianas there are large tracts under coffee cultivation, and delicious fruits are grown ; the population here is mainly of white extraction, with an aboriginal residue. The cool or subfrigid zone (above 6,500 feet) is described as a region of perpetual springtime, where the cereals and other agricultural productions of Europe flourish ; it is inhabited mainly—in some parts exclusively—by people of European stock. The diseases of the temperate and the zone above it are very much the same as those of France, except that epidemics of pneumonia occur in the more elevated parts and amoebic dysentery and malaria come up from the valleys below. In these zones the eruptive fevers are more benign and less liable to complications than in France ; tuberculosis was formerly unknown, but has been introduced by invalid visitants to this delightful climate ; syphilis is wide spread, cancer is rare ; *chichismo* is a chronic polyneuritis and idiocy caused by addiction to *chicha,* a drink made from fermented maize—it occurs chiefly among the lower classes. In the torrid zone of the riverine plains and valleys amoebiasis, ankylostomiasis, leishmaniasis, spirochaetosis, and all forms of malaria are prevalent and leprosy exists, the number of lepers being estimated at about 6,000, the population of the republic being seven millions. In respect of sanitation Colombia is making progress. A hookworm campaign is being carried on under Rockefeller auspices ; itinerant sanitary commissioners treat malaria and organize arrangements for the control of mosquitoes ; there are antivenereal dispensaries on French models ; there are 3 lazarets, on the agricultural colony system, for lepers, for whom notification and isolation are obligatory ; and there is a central laboratory of hygiene, where the scope and routine are those of Western Europe. There are in the country 3 schools of medicine, and the history of the principal one, at Bogota, is given in some detail. It began as a private enterprise in 1864, and in 1867, when a national University was established, it was incorporated therein as the Faculty of Medicine. Its curriculum is a very full one and extends over six academic years of nine months. Entrants must be graduates in the humanities and must have passed in English and French.

A. A.

JOHNSTONE (F. J. Carlyle). **The Biology and Pathology of the Natives of the Central Kavirondo District, Kenya Colony.**—*Trans. Roy. Soc. Trop. Med. & Hyg.* 1923. Dec. 13. & 1924. Jan. 17. Vol. 17. Nos. 6 & 7. pp. 369–377.

This interesting enquiry, somewhat new in British tropical possessions, was made in 1922 and chiefly amongst the Nilotic Kavirondo. The author was stimulated thereto by a review of an article by KÜLZ (this *Bulletin,* Vol. 17, p. 207). To arrive at the biological figures each woman was questioned as to the number and sex of her children, the numbers living and dead, the age at death, and as to still-births and abortions. The reproductive period was taken as from 15 to 40. The methods of calculating fertility are explained and the results shown in a table. 2,591 married women were examined, of estimated mean age 25·7 years. The barren women (married 5 years and without children) numbered 17, or 0·7 per cent., a low figure. The estimated number of children during the child bearing period was 6, and a direct enquiry to 193 women over 40 gave a slightly larger figure, 7·4, twice that of England. The proportion of live births to still-births and abortions was 100 : 7. Of the 7,843 children the total deaths up to 16 were 4,472, or 57 per cent. 72 per cent. of the deaths occurred in the first year, giving an infantile mortality rate of about 400. Male to female births were 104·8 : 100. The pathological statistics are summed up in the table. The high splenic index in children is attributed to malaria. The "deformities of the feet" refer chiefly to losses of toes from jiggers, and cause little disability. The author suggests that some of the cases diagnosed syphilis should be classed under yaws. The natives assert that yaws is acquired in sexual intercourse and causes abortion [but the abortion rate is by no means high]. It is noted that the causative agent of "scabies" has never been isolated; it yields to sulphur treatment.

Pathological Statistics, Central Kavirondo.

	Under 16.	*Over* 16.
Total examined	3,280	4,787
Enlarged spleens	14·6 per cent.	1·4 per cent.
Ulcers	2·3	1·3
Deformities of feet	0·2	3·4
Yaws	4·2	3·2
Diseases of eye	1·3	3·0
Umbilical hernia	1·9	0·1
Scabies	5·4	0·3
Small-pox scars	0·4	3·2
Syphilis	0	1·1
Leprosy	0	0·1
Other causes	0	1·3

The chief causes of death he estimates to be, pneumonia, enteritis, especially in childhood, malaria, plague, small-pox, yaws, dysentery, starvation in famines. The popular belief that the native in his natural surroundings is healthy and vigorous is incorrect. One has actually to visit them in their own villages and live among them to realise the amount of ill-health from which they suffer. The well-known insanitary conditions are then described, and it is questioned "whether curative treatment for any specific disease is not largely a waste of time and money when the patient has afterwards to return to his own surroundings." This problem is discussed with the conclusion that what is required is a sound system of education and an increase in prosperity. An object lesson in the shape of a number of model villages in the native reserve is suggested. [The paper is a useful contribution to our knowledge of native health in tropical Africa.]

A. G. B.

ROSE (F. G.) & CHOW (J. E.). **A Résumé of the Scientific Work published by Medical Men in British Guiana from 1769 to the Present Day.**—*British Guiana Med. Annual for* 1923. pp. 53-62.

Among the famous men of British Guiana whom the authors praise are Edward BANCROFT who, in 1769, in an essay on the Natural History of Guiana, described leprosy, yaws and guinea-worm; G. PINCKARD, who in the same year described his own case of yellow fever and an autopsy on that disease; BLAIR (1835), who wrote of yellow fever:— Its peculiarity of arising in separated and isolated spots in a community could only be explained on the supposition that insects carried the disease; WARBURG, of tincture fame; BEAUPERTHUY; and many surviving "Titans" for whose exploits the paper must be read. It is a fine record of which the authors may well be proud.

A. G. B.

JACKSON (J. H. S.). **Causes of Depopulation among Some Island Peoples.**—*Med. Jl. Australia.* 1924. Jan. 19. 11th Year. Vol. 1. No. 3. pp. 58-61.

The author is a medical officer of the Kaewieng District of the Mandated Territory of New Guinea, which includes the northern half of New Ireland and certain island groups with, in all, a population of 25,000. In every census taken on patrol the deaths were found to exceed the births. Among over 15,000 people in 5 districts the births varied from 11·8 to 41 per mille, the deaths from 39·2 to 65·8. Owing to the conditions in which delivery takes place and the want of rest at that time there is much sub-involution and congestion of the uterus, often followed by acute angled retroflexion, which must render conception unlikely and favour abortion. Other causes of low birth rate are prolonged lactation, unsuitable mating, recruitment of virile men for the plantations.

Syphilis and gonorrhoea are reputed to be common but are actually rare. In over 9,000 examinations gonorrhoea was found but 10 times. As to syphilis, no primary sore nor hereditary syphilis was seen in 15,000 examinations, ulcers which were possibly syphilitic did not yield to specific treatment, para-syphilis was absent, and the author concludes that syphilis if it exists at all is very rare. The scourge of the district is malaria. "Its influence on both birth and death rates is greater than that of all other factors." The spleen index showed nearly 80 per cent. of the population to be infected.

The author mentions also the effect of the adoption of the white man's clothes and habits and the relinquishment of the native practices as tending to lessen interest and loosen the hold on life [cf. RIVERS, this *Bulletin,* Vol. 20, p. 83].

A. G. B.

DE BUEN (Sadi). **Distribution géographiques de quelques maladies parasitaires en Espagne.**—*Ann. Parasit. Humaine et Comparée.* Paris. 1924. Jan. Vol. 2. No. 1. pp. 90-98. With 3 text figs. [41 refs.]

The parasitic diseases of chief general interest in Spain are malaria and kala azar.

Malaria is endemic over about half Spain, judging from the charts here published, chiefly the southern and western provinces. Its distribution is not yet worked out. The annual mortality in the last ten years has been 2,000 or rather less. All three forms are found. The most extensive malarial area is in the province of Cáceres, where in 1923 2,817 cases out of 7,134 were diagnosed by the microscope.

The first case of infantile *kala azar* in Spain was described in 1912. In 1922 the author published a list of 63 cases from 4 inland and 8 maritime departments. He is aware of 88 cases, about a third of which have been discovered in the last year. Oriental sore is less common.

Other parasitic diseases are relapsing fever, a small focus in Cáceres; icterohaemorrhagic spirochaetosis; sodoku (case described 1885); amoebic dysentery, a few cases; coccidiosis, one case; giardiasis, a few cases with diarrhoea; cestode and nematode infections. In one of the mines, of 478 workmen 338 or 70 per cent. were infected with ankylostomes.

There is a useful list of references.

A. G. B.

Popoff (Peter). **Some Notes on Medical Conditions in Transcaucasia.**—*Jl. Trop. Med. & Hyg.* 1924. Jan. 15. Vol. 27. No. 2. pp. 13–14.

This is a description of Armenia which lies in Southern Transcaucasia. One result of the war was that cereals could not be obtained, so that land which had been cultivated for cotton was put down to rice, grown by the wet method. A great increase of malaria followed, and the author with Prof. Marzinovsky has established anti-malarial stations and an institute for the study of tropical diseases. *Anopheles claviger* and *A. pseudopictus* are common, *A. bifurcatus, A. plumbeus* and *A. superpictus* rare. Four species of Phlebotomus have been identified and phlebotomus fever is common. Thirteen cases of pellagra, a disease not hitherto diagnosed, were seen; nine were in refugees. Leprosy has long existed; quotations are given from a book published in A.D. 386–7 prescribing regulations for lepers. They are not now segregated. Mediterranean fever, hill diarrhoea and probably sprue were seen.

A. G. B.

Dudgeon (L. S.). **Certain Problems which concern Intestinal Infection and the Intestinal Flora.**—*Proc. Roy. Soc. Med.* (Sect. of Trop. Dis. & Parasit.). 1924. Jan. Vol. 17. No. 3. pp.–1–6. [16 refs.]

Owing to hygienic, climatic and dietetic conditions, intestinal disorders assume greater importance in tropical and sub-tropical countries than elsewhere. The author and his colleagues distinguish two groups of colon bacilli, haemolytic and non-haemolytic; the latter are the common inhabitants of the normal intestinal tract of man, but in abnormal conditions, such as diarrhoea and colitis, there is a great increase of the former. The intestinal flora has to be investigated with a full appreciation of the factors concerned, such as:—diet, condition of mouth and throat, pathological processes in intestinal or respiratory tracts, diarrhoea or constipation, the influence of purgatives and the time elapsing between the collection of the specimen and the bacteriological examination.

For some time past the author has investigated the intestinal flora, the clinical condition and diet of the patient being fully controlled. The faeces should be dried on sterile porous tiles and work undertaken with a mixture of the dry powder thus obtained [see this *Bulletin*, Vol. 19, p. 84].

P. H. M-B.

Concepción (Isabelo). [In English & Spanish.] **Notes on the Blood Sugar Content of Filipinos. Apuntes sobre glucosa en la sangre de los Filipinos.**—*Jl. Philippine Islands Med. Assoc.* 1923. Nov.–Dec. Vol. 3. No. 6. In English pp. 285–291. [16 refs.] In Spanish pp. 337–341.

De Langen and Schut in Batavia obtained an average of 0·16 per cent. of sugar in the blood of normal Javans and almost the same figure for Europeans resident in Java, 30 to 70 per cent. higher than the corresponding figure in Europe; they suggest that the excess is of climatological origin (this *Bulletin*, Vol. 9, p. 259 ; and Vol. 13, p. 43). McCay found an average of 0·13 per cent. in Bengalis in Calcutta,and attributed the high percentage to an excess of carbohydrates in the diet. [The figure given for Europeans in Europe is 0·08 per cent.] The author's work was done on Filipinos, 80–90 per cent. of whose diet consists of rice. Thirty-four subjects, all healthy, were studied. Table 4 compares the three series mentioned for natives, and Table 5 this series and the Dutch series for Europeans.

Table 4.—Blood Sugar in the Natives of the Tropics.

Author.	Method.	Nationality.	Cases.	Mgs. of sugar per 100 cc. Min.	Max.	Average.
De Langen & Schut	Bang	Javans ..	16	110	210	152
McCay	Michaelis-Rona	Bengalis	50	87	200	130
This series ..	Myers-Bailey	Filipinos	30	85	157	123

Table 5.—Blood Sugar of Europeans and Americans of long Residence in the Tropics.

De Langen & Schut	Bang ..	European	9	125	205	158
This series ..	Myers-Bailey	American	11	110	152	134

The author's figures are much lower than those of McCay and of De Langen and Schut. The amount of sugar in Europeans long resident in the Philippines was 15 per cent. less than that of Europeans in Java; though the figure is higher than the American standard in the U.S.A., the author would ascribe the difference to causes other than climate.

A. G. B.

Holtappel (K. J.). **Bloedsuikerbepalingen.** [Bloodsugar Determinations.] —*Geneesk. Tijdschr. v. Nederl.-Indië.* 1924. Vol. 64. No. 1. pp. 101–115. [12 refs.]

Holtappel recommends the method of Hagedorn-Norman-Jensen, the technique of which is described in detail; it is said to be simple, trustworthy and quick. The bloodsugar values he obtained agree with European figures. The author ascribes the higher values found by de Langen and Schut (see this *Bulletin*, Vol. 13, p. 43) in healthy individuals in Java to faulty technique, especially to the possibility of reoxidation of cupro compounds in their modification of Bang's method.

W. J. Bais.

i. TAYLOR (J.) & DOUGLAS (A. R. J.). **The Deterioration of Insulin in India.**—*Indian Med. Gaz.* 1924. Jan. Vol. 59. No. 1. pp. 26–27.

ii. THE BRITISH DRUG HOUSES LTD. ; ALLEN & HANBURYS, LTD. **Insulin in the Tropics.** [Correspondence.]—*Lancet.* 1924. Jan. 12. p. 101.

i. Trial of insulin from two sources, American and British, led the authors at Rangoon to infer that it had retained but a small portion of its original potency. After clinical failure tests were made on rabbits with similar results. In neither instance had cold storage been employed in transit or in India. It is suggested that Government control and examination of insulin supplies may be advisable.

ii. The writers believe that "A.B." insulin does not suffer loss of activity in the tropics. The contents of two bottles returned from India with a report of loss of activity were tested in London and found to be as potent as at the first. Cold storage had not been used. They give figures in support of the suggestion that the quantitative reaction of rabbits in India is not that of temperate climates ; the blood sugar does not undergo the same reduction.

A. G. B.

VASAVADA (D. M.). **The Dosage of Sodium Cacodylate Intravenously.**—*Indian Med. Gaz.* 1924. Mar. Vol. 59. No. 3. pp. 131–132.

The author advises the use of large doses of sodium cacodylate, 10 to 30 grains twice a week, intravenously in 5 cc. of distilled water. He states, without details, that the class of cases benefited includes anaemia, some forms of sprue, quinine-resistant malarial cachexia, psoriasis, syphilis, chronic bronchitis and phthisis, and characterizes the results as "striking." Toxic effects were never seen.

A. G. B.

CONNOR (F. P.). **The Use of Intravenous Injections of Iodine in the Treatment of Septicaemia and other Septic Conditions.**—*Indian Med. Gaz.* 1924. Mar. Vol. 59. No. 3. pp. 125–126.

The author's experience of treatment by intravenous injections of iodine goes back to 1913 when he published an account of cases of plague so treated (this *Bulletin,* Vol. 2, p. 72). He has since used intravenous iodine in many cases of surgical sepsis in his wards and believes it to be of value. He gives small doses and suggests that they act by stimulating the thyroid gland. He refers to JEUDWINE's paper and notes that he has not observed the hyperleucocytosis described by JEUDWINE (see this *Bulletin,* Vol. 21, p. 408). A discussion elicited the facts that the treatment had been tried and found wanting in kala azar and malaria.

A. G. B.

MUENCH (Hugo). **Report of a Case of Illness after Treatment with Chenopodium, with Reference to the Possibilities of Toxic Effects following the Administration of Magnesium Sulphate.**—*Jl. Amer. Med. Assoc.* 1924. Jan. 5. Vol. 82. No. 1. p. 33. [3 refs.]

A child of 6 under chenopodium treatment at Surinam received one ounce of magnesium sulphate in the morning and another a few hours later, in 25 per cent. solution. The bowels were not moved. In the evening she became comatose but eventually recovered. It is suggested that the toxic results were due to paralysis of the bowels by a large ,concentrated dose of magnesium sulphate which would favour the absorption of the chenopodium. The dose was too large and too concentrated.

A. G. B.

BOSE (J. P.) & MUKERJI (Arun Kumar). **Liver Function Tests and Carbon Tetrachloride.**—*Indian Med. Gaz.* 1924. Mar. Vol. 59. No. 3. pp. 127–130. With 1 chart. [20 refs.]

The authors discuss the various methods which have been described for testing the functional activity of the liver and especially the laevulose tolerance test. They recount the results of the various observers who have studied the action of carbon tetrachloride on the liver, and finally give a table of nine cases of ankylostomiasis treated at Calcutta with 70 minims of pure carbon tetrachloride followed by a purge, the course being repeated the next day, in which the results of laevulose tolerance tests are expressed. The interval between the last dose and the test varied between 1 and 18 days. No damaging effect on the liver whatever was shown.

A. G. B.

REMLINGER (P.). **Sur le Géophagisme au Maroc.**—*Bull. Soc. Path. Exot.* 1924. Feb. 13. Vol. 17. No. 2. pp. 149–152. [3 refs.]

The author has observed the habit of earth-eating or geophagism at Tangier, chiefly in small children of the middle classes ; he regards it as a perversion of taste. To break the habit is very difficult, but it is generally lost at the age of 8 10. It rarely leads to dyspepsia, fever, or infection, which is remarkable. Though Arab, Jew and European children play together earth-eating is only seen in Mussulmans.

[Nothing is said of verminous infections in these children.]

A. G. B.

DUNCAN (J. T.). & MANSON-BAHR (P. H.). **The Action of "Bayer 205" on the Tissues in Fatal Cases of Kala-Azar and Trypanosomiasis.**—*Trans. Roy. Soc. Trop. Med. & Hyg.* 1923. Dec. 13. & 1924. Jan. 17. Vol. 17. Nos. 6 & 7. pp. 392–399. (Discussion pp. 399–400.) With 3 figs. [16 refs.]

Reference is made at the outset to two conflicting instances of the conjectured results of the treatment of kala azar with Bayer 205 ; in one, recorded by MOLLOW, the patient succumbed after a dose of 0·25 gms., in the other, reported by YORKE, the patient received 1·75 gm. in three doses and subsequently gained 14 lb. weight within a month and was regarded as cured.

In the case here reported the patient was a young Lascar admitted with a history of 3 weeks' fever. Except for a little anaemia he exhibited no signs or symptoms of disease during the first fortnight in hospital, not even a rise of temperature ; but examination of material obtained from liver puncture and of faeces led to respective discoveries of leishmania and of ankylostome eggs. Gradually after that first fortnight a characteristic pyrexia became established, the spleen increased to the level of the navel, and notwithstanding antimony treatment the patient's condition became serious. Then an injection of 0·5 gm. of Bayer was given and was followed by injections of 1 gm. at weekly intervals until a sum of 3·5 gm. had been received. After the 2nd injection there was a remarkable diminution in the size of the spleen ; but immediately after the 4th and last, the pulse collapsed, there was air hunger, the temperature rose above 104° F., the anaemia became intense, albumen and casts appeared in the urine, and death soon followed.

At the autopsy 12 hours after death, besides enlargement of liver and spleen and degenerated leishmania in the bone-marrow (only), the lungs were hyperaemic and showed sporadic haemorrhages and small consolidations (clots) and the kidneys were congested and showed extensive degeneration of the cortex.

A very minute and particular account is given of the morbid histology of all the viscera and other organs, but it must be sufficient here to summarize the account of the changes observed in the kidneys and lungs which alone are attributed to the action of the drug. The changes in the kidneys consisted of cloudy swelling and deposit of fatty granules in the epithelium of various parts of the tubules, increase of the interstitial fibrous tissue, vascular engorgement, and petechial haemorrhages and small necrosed patches in medulla and cortex. The lungs showed capillary engorgement and blocking of the alveoli with haemorrhages and with masses of cells, polymorphonuclears being rare and evidence of inflammation absent.

The pathological changes observed in a case of trypanosomiasis that ended fatally after treatment with Bayer 205 are described.

The patient in this case received 33 gm. in the course of six months, 15 gm. having been given in the month preceding death. Here, too, the kidneys were enlarged and appeared dark and congested as in acute nephritis, and there was cloudy swelling of the convoluted tubules, and the lungs also were intensely congested, especially at base. Furthermore, there was general atrophy of the skin, especially of the forearms, and hyperkeratosis of the soles of the feet.

Finally, in order to determine more precisely the action of the drug, the authors administered poisonous doses to six white mice, of which four received a single dose proportionate to 1 gm., and two a single dose proportionate to 1·4 gm. per kilogm. of body-weight, death following in the course of 4 to 15 days. The changes observed, post mortem, were as follows : In the *liver*, venous engorgement and general cloudy swelling ; focal necroses often containing haemorrhages ; very slight perivascular round-cell infiltration ; intracellular fatty deposits varying from granules to large droplets. In the *kidneys*, extensive degeneration and exfoliation of the epithelium of the convoluted and other tubules of the cortex ; hyaline casts in some of the tubules ; a few necrotic foci ; vascular engorgement, minute haemorrhages, and remarkable perivascular round-cell infiltration throughout the cortex. In the *lungs*, some engorgement of the alveolar capillaries and small areas of haemorrhage into the alveoli. In the *spleen*, engorgement but not haemorrhage. In the *stomach* and *intestine*, minute sporadic patches of congestion and doubtful submucous haemorrhages. In the *brain*, minute haemorrhage in the cortex and white matter of cerebrum and cerebellum. No change was observed in the heart.

The changes observed in these mice suggest that the vascular endothelium is selectively affected by Bayer 205.

A. A.

TIMPANO (P.). **Sopra alcuni casi di Amebiasi, Anchilostomiasi, Febbre Maculosa e Adenite inguinale epidemica.**—*Giorn. di Clin. Med.* Parma. 1924. Mar. 20. Vol. 5. No. 4. pp. 133–136.

The author records briefly some of the cases he met with in Calabria in 1923. Of 7 cases of amoebiasis 5 were diagnosed by the finding of amoebae in the stools; the remaining 2 are placed in the same category because they cleared up on administration of emetine. The case reported as spotted fever showed a macular, dark red rash on the neck, trunk and limbs, involving also the palms and soles. There was fever with headache and general pains, and later considerable prostration. The temperature was only 38°–38·5°C., and became normal in a fortnight; there was no desquamation. Under Epidemic Inguinal Adenitis mention is made of 12 cases, five with unilateral involvement. Each suffered from a rise of temperature lasting for 1–3 days and the glands remained swollen for six weeks. Suppuration occurred after three to five weeks in five of the patients. No cause was discovered for the enlargement of the glands, but the author is of opinion that the condition differs from that described as climatic bubo. The "epidemic" was not alarming; one case occurred in June, three in September, seven in October, and the remaining one in November.

H. Harold Scott.

LE DENTU (R.). **Paludisme et ver de Guinée en Haute-Volta. Prophylaxie commune.**—*Bull. Soc. Path. Exot.* 1924. Jan. 9. Vol. 17. No. 1. pp. 104–107.

The two serious endemic diseases of Haute Volta (W. Africa) are malaria and guineaworm; in the earlier months of the rainy season more than half the population of the villages is affected with them. The country naturally would be healthy; but it has been made malarious and dracunculous by the waters that stagnate in ponds and in the hollows made by the natives in getting earth for their mud huts. As there are no streams the natives have to drink this water and use it for all other proper and improper purposes.

A. A.

GIEMSA (G.) & SEI (S.). **Ueber die Einwirkung von Natronsalzen verschiedener Bismutylweinsäuren auf Trypanosomen und Rekurrensspirochäten im Mäuseversuch.** [Action of the Sodium Salt of Various Bismuthyl Tartrates on Trypanosome and Relapsing Fever Infection in Mice.]—*Arch. f. Schiffs- u. Trop.-Hyg.* 1924. Jan. Vol. 28. No. 1. pp. 20–26. [7 refs.]

The authors refer to previously published experiments with these bismuth salts. The salts employed are named natrol, B5 and B7, and they were given subcutaneously. The trypanosome infections were nagana, mal de caderas and dourine. The results are set out in tables. Dourine trypanosomes were affected not at all by natrol and little by B5 and B7. Mal de caderas, little by natrol, more definitely by B5 and 7. Nagana not at all by natrol, strongly by B7, and still more strongly by B5. Of 6 mice thus treated one was permanently cured, but less than half the effective dose of B5 had action, driving the trypanosomes for some days from the blood, in two instances twice. The authors suppose that the reappearance of parasites in the blood is accompanied by an increase of temperature which causes more of the drug to be absorbed from its "depot" under the skin. The action of these three substances increases with the bismuth content. In the relapsing fever infections, in which treatment was begun before the parasites appeared, the result of B7 and B5 injections was that in the first attack spirochaetes were less numerous in the blood than in the controls, and the first relapse was as a rule cut out, the next relapse occurring. It is planned to repeat these experiments substituting intravenous for subcutaneous therapy.

A. G. B.

RAMANATHAN (S.). **Notes on Some Methods of Malingering adopted by Prisoners.**—*Jl. Ceylon Branch Brit. Med. Assoc.* 1923. Sept.-Dec. Vol. 20. No. 3. pp. 43–44.

This is a catalogue of ailments feigned by malingering prisoners, apparently compiled from the author's experience. (1) Conjunctivitis, induced by lime, soap, tobacco, and irritant plant-juices, of which two, known as "varra" and "olinda," sometimes produce very serious effects. (2) Otitis, produced by putting small pieces of stone and other mechanical irritants into the auditory meatus. (3) Tumour of the cheek simulating mumps, said to be caused by application of an irritant leaf. (4) Pains and aches in chest and back. (5) Appendicitis, sometimes shammed by educated prisoners. (6) Diarrhoea and dysentery, produced by irritants, or by mixing stools with urine or water, and blood spat from gums. (7) Piles and prolapse caused by constant straining. (8) Cellulitis, by subcutaneous application of "olinda" juice, or by deliberately making a clean wound septic, or by strangling a limb with a bandage. An experienced malingerer under long sentence often prefers practising professionally among enterprising fellow prisoners to adventuring on his own account, fees being paid in surreptitious drowsy narcotics.

A. A.

MOSS (K. Neville). **Some Effects of High Air Temperatures and Muscular Exertion upon Colliers.**—*Proc. Roy. Soc.* 1923. Aug. 1. Vol. 95. Ser. B. No. B666. pp. 181–200. With 1 plate.

Prof. Moss of Birmingham University has performed a useful piece of work on this subject, which, though it has no special bearing on tropical conditions (*e.g.*, heat stroke) has considerable interest in itself. It was no small feat to get hold of sixty colliers of sufficient intelligence and patience to undertake a return of their daily diet for 7 to 10 days, and the results are sufficient to give a trustworthy average. No one can urge that they are underfed and the daily calorie supply works out as 4,711. This is in accord with what we know of the requirements of men in hard work. The liquid drunk increases with increase of temperature, especially over 70°F.; this is related to the amount of sweating, and one collier drank as much as 13·6 pints a day. The amount of solid food also increased with rise of temperature; this is a little unexpected and still more so is the larger proportion of salted food (such as ham) ingested. The work included observations on the amount of respiratory exchange, but the figures only relate to one man, and so are of less importance. More interest attaches to the question of sweating; the increase of sweat leads to a great rise in its sodium chloride content. So much so that in extreme cases the urine contained little or none. This is connected further with the amount ingested in salted foods, which seem instinctively taken, and with a semi-political problem whether a salt tax in hot climates is justifiable. This last consideration is accentuated when Prof. Moss comes to the last section of his work, viz., miner's cramp, a by no means uncommon complaint in other workers (*e.g.*, stokers) in high temperatures. It is due to continuance of hard work especially among those not physically fit, combined with the excessive drinking of water. In fact, it is an example of water poisoning which can be artificially induced in animals (ROWNTREE). It ought to be possible to give the colliers a drink containing enough salt to balance the loss of salt by sweating. Even the pit ponies are wise in this respect and lick the rock salt which is provided. Accordingly a selected number of men were given salt and water (10 grams of NaCl to the gallon) and the results were most promising and usually led to disappearance of the cramp. The man in the street would hardly select a saline draught to alleviate thirst, because it is an article of faith with him that salt breeds thirst, but the man in the street, especially if the street is rich in liquor shops, evidently wants educating, and the subject of water intoxication presents him with a new field for his activity.

W. D. Halliburton.

KIEWIET DE JONGE (G. W.). **Over het lichaamsgewiche van Europeanen, Indo-Europeanen en Chineezen in Nederlandsch-Indië.** [On the Body Weight of Europeans, Eurasians and Chinese in the Dutch East Indies.]—*Geneesk. Tijdschr. v. Nederl.-Indië.* 1924. VOL. 64. No. 1. pp. 83–100. With 11 text figs. [2 refs.]

As medical adviser of a life insurance company having filed reports at his command the author calculated the average weight in relation to height and age of 5,992 Europeans, 4,092 Eurasians and 1,256 Chinese, all males, accepted by the company as satisfactory risks. The results, which differ considerably from the European and American tables generally used by medical advisers, are represented in graphs, which should be consulted in the original paper. The weights of Eurasians and Chinese are as a rule much lower than those of Europeans.

W. J Bais.

SERGENT (Edm.), PARROT (L.) & DONATIEN (A.). **Une question de terminologie:** *Immuniser* **et** *Prémunir.*—*Bull. Soc. Path. Exot.* 1924. Jan. 9. Vol. 17. No. 1. pp. 37–38.

Distinctive terms are here proposed for (*a*) true, permanent, sterilizing, solid, immunity, characterized by total disappearance of the attacking microbe and impossibility of re-infection ; and (*b*) immunity of equilibration or tolerance, characterized by chronic resistance to a microbe that is not completely vanquished, and that, if at last overcome, leaves the way open for re-infection. For absolute immunity the distinguishing term proposed is "immunity" brought about by a process of "immunization" or "vaccination," with verbs to correspond ; and for relative immunity, "premunition" brought about by a process of "premunition," with corresponding verb. [Unfortunately English words corresponding with "premunition" and "premunir" do not at present exist, and English equivalents of those words have precontracted associations.]

A. A.

VARENNE. **Hôpital et dispensaire français de Smyrne en 1922.**—*Arch. Méd. et Pharm. Nav.* 1924. Jan.-Feb. Vol. 114. No. 1. pp. 62-67.

This short report is to a considerable extent occupied with the disasters that overtook Smyrna in September 1922, of which the hospital appears to have suffered a full share. There is little medical news of general interest.

The dispensary is said to have been extremely popular, the daily number of out-patients being from 150 to 200. In the hospital 347 cases were treated, the total number of days of treatment being 5,634. Beyond the mention of an epidemic of scarlatina nothing is said of any unusually prevalent disease during the year.

A. A.

ZSCHUCKE. **Ueber die Wirkung von Zymarin bei Herzschwäche.** [The Action of Zymarin in Heart Weakness.]—*Arch. f. Schiffs- u. Trop.-Hyg.* 1924. Jan. Vol. 28. No. 1. pp. 33–34.

The author finds that cardiac weakness, especially that of severe ankylostomiasis, is relieved by ingestion of Zymarin, the active constituent of *Apocynum cannabinum*, of the firm of Bayer, Leverkusen, after which it is safe to give vermifuges. He relates two cases in which he administered the drug by intravenous injection.

A. G. B.

MULLER (H. J.). **Observations of Biological Science in Russia.**—*Scientific Monthly.* 1923. May. Vol. 16. No. 5. pp. 539–552. With 5 text figs.

The author, from observations made chiefly in Moscow, gives us an impression of Russian biologists quite unlike the Mantuan apothecary of the tragedy, in tattered weeds, with famine in his cheeks, worn to the bone with misery and contempt, that we recently have been picturing to ourselves. He thinks nothing worse than that they are considerably obstructed by their isolation and consequent ignorance of what is being done in the scientific world outside. He admits that they have no love for the Government, and that it is not so very long since some of them endured the afflictions of imprisonment and even of impending execution for their political opinions; also that they have had to overcome " almost inconceivable difficulties " of a purely material and mechanical kind in getting their scientific institutions established; and furthermore, that their remuneration is pitiful. But the laboratories and the experiment-stations appear to be there, in Moscow and Petrograd, in working order and staffed with experienced men who get from the Government a food-ration and a salary which in the highest grade of employment slightly exceeds that enjoyed by Goldsmith's Vicar of Wakefield.

In Moscow eight such state institutions for different branches of biology have been established under the Ministry of Public Health since the revolution. The author mentions the Institute of Experimental Biology and its two annexures in the country, namely, the station for genetics and the hydrobiological station, in which two stations together there are forty or fifty workers; the Institute of Tropical Medicine, with its departments of protozoology, entomology, and helminthology, its medical school and its school for laymen; the handsomely-fitted Biochemical Institute; the Institute of Physics, Biophysics, and Photochemistry, a magnificent and well equipped building with a scientific staff numbering 40; and the Institute of Work, with its 30 skilled assistants and 70 helpers, where the effects of specific kinds of work, mind-testing for specific occupations, and other esoteric branches of physiology are studied.

At Petrograd the author visited only the Bureau of Applied Botany, which has utilized the neighbouring estates of the deposed nobility for its various projects, the palace of a fallen Grand Duke being now devoted to the study of genetics. Here he heard at first hand a story having morals so obviously multifarious that we forbear to draw them. The story is that the publication of a paper by a worker in this institution has been stopped by the revolutionary government because it expresses views on the influence of predetermined elements in the evolution of the germ which are held to be subversive of the doctrine of Natural Selection. After this, the author's sanguine account of the enterprises of official science in Russia becomes for us sicklied o'er with the pale cast of thought, and we can but emphasize his lamentation of the present deplorable isolation of Russian biology and endorse and support his plan for relieving it. This simple plan is that we individually should supply the Russian institutions with all the reprints and back numbers that we can spare. To avoid customs duty they should be addressed not to individuals, but to institutes, and the author has published in *Science* of 20th April, 1923, a list of fitting institutions.

A. A.

ATKINS (W. R. G.). **The Hydrogen Ion Concentration of the Soil and Natural Waters in Relation to Diseases other than Bacterial.**—*Parasitology.* 1923. June. Vol. 15. No. 2. pp. 205–210. [20 refs.]

An argument, based on certain known facts regarding the influence of the hydrogen-ion concentration of water and soil on certain animals (particularly mosquito larvae and snails), advocating the importance of measurements of hydrogen-ion concentration by field workers in studying the distribution of animal species.

A. A.

RIPPON (T. S.). **The Effect of Tropical Climate on Physical and Mental Efficiency.**—*Proc. Roy. Soc. Med.* (War Section). 1923. Aug. Vol. 16. No. 10. pp. 45–54. With 2 charts in text. [18 refs.]

An essay on visual fatigue in India and Egypt from the standpoint of the R.A.F. Medical Service, with some considerations on the impairment of mental efficiency induced by a tropical climate, again with the pilot in mind.

A. G. B.

PHIPSON (E. S.). **The Pandemic of Influenza in India in the Year 1918 (With Special Reference to the City of Bombay).**—*Indian Med. Gaz.* 1923. Nov. Vol. 58. No. 11. pp. 509–524. With 4 charts. [13 refs.]

The author of this interesting paper reminds us that in the space of two months of 1918 influenza killed no fewer than eight millions of Indians. He was Assistant Health Officer in Bombay City and writes of the epidemic as he saw it there. After some consideration of previous epidemics, and especially that of 1890, he points out that in the latter half of 1918, whereas plague and malaria incidence was below normal, the stocks of food-grains in India were low and prices correspondingly high, milk was scarce from lack of fodder and medical personnel sparse owing to the calls of the war. Influenza appeared in Bombay in June, but whether it was imported or developed in the Province is uncertain. In February and March a similar disease was reported from the Thana district and the mortality rates were above the normal for the time of year; on the other hand, though the first cases to be noted in Bombay occurred on a transport in dock, this was not till there had been free communication with the shore for 48 hours.

First phase.—This was studied from the records of 10 municipal dispensaries which furnished 3,000 cases, from those of private practitioners and from large firms, schools, etc. The origin of the earliest cases was in the docks and shipping and the lowest incidence was among the health department sweepers, Hindus of the lowest caste, only 4 per cent. of whom were affected. In the second wave, however, they suffered severely. The incidence among children and young adults was heavy, 70 per cent. of the cases treated at dispensaries, and the European incidence was 17, as against 29 per cent. for Indians. The symptomology presented nothing unusual. Normally, the deaths between June 15 and July 15 would have amounted to 3,100; they actually reached 4,740; the difference, 1,640, is taken to be the influenza mortality. A chart shows the effect of the epidemic on the mortality from various diseases. There is a significant rise in "ague and remittent fever," "debility and old age," and especially "respiratory diseases." The case mortality is reckoned as about 5 per cent., or 1·5 per 1,000 living.

Second phase.—The second wave broke on September 10, after an interval of freedom of about two months; it apparently came from the Deccan highlands. By the 30th the daily mortality for the city had risen from the usual 102 to 712, and on October 6 reached 768. The highest mortality in a day had previously been 433—in a bad plague epidemic. By November 11 the death-rate had become normal. A description is given of the efforts made to cope with the epidemic—a publicity campaign, free milk, pneumonia jackets, emergency dispensaries, gifts of blankets and the like, and the appeal for co-operation had a wonderful response. The second resembled the first phase, but fatal complications, especially broncho-pneumonia, were far more frequent; "it seemed to be as fatal to strong adults as to young children and to the old and debilitated." Glen LISTON found that the pneumococcus and influenza bacillus were the only pathogenic organisms at all constantly met with in fatal cases and were almost invariably in association, and the same was recorded from Karachi. The susceptibility of the Indian to pneumococcus toxaemia is well known. Streptococci, commonly found in England, were in India rarely met with. The mortality of the 62 days of the second phase, calculated in the same way as before, amounted to 14,678, equivalent to 13·3 per 1,000 of the estimated population, or more than 3 times that of the urban population of England and Wales in the three epidemic waves 1918-19. But Bombay city suffered slightly compared with other parts of India, the Central Provinces, Delhi, Bombay, Punjab and N.W. Frontier having all a rate over 40 per mille, the first two being 56 and 55. Bengal was lowest with 4·7, and the total for British India was 20·6 per mille. For the mortality, 36 per cent. of the deaths occurred among people 20 to 40 years old, and the figures for the respective communities were as follows:—

Europeans	8·3	Indian Christians ...	18·4
Parsees	9·0	Caste Hindus ...	18·9
Eurasians	11·9	Mohammedans ...	19·2
Jews	14·8	Low Caste Hindus ...	61·6

This is the order and degree in which mortality generally affects the communities of India.

Finally, the problems of prevention and control in an oriental city are discussed. With our present lack of knowledge it is not possible to keep the disease out. The measures considered are—an International Bureau of Public Health which would report the incidence of the disease; quarantine (impracticable except as regards isolation of severe cases in hospital); notification (useless in India, where the doctors are chiefly native practitioners of Eastern systems of medicine); improvement of registration of mortality statistics (practicable in Bombay city); methods of publicity, including the making known of emergency arrangements; protection of medical and nursing personnel by inoculation, masks, treatment of nasopharynx and the like (vaccine prophylaxis is *sub judice*); closure of schools and cinemas (schools offer a better environment than home, but cinemas are a real danger); organization of a domiciliary nursing service (hardly feasible owing to prejudice and shortness of personnel); provision of institutional treatment on large scale, which is in the author's opinion one of the most efficient methods of reducing mortality.

" The elementary school of the future," he writes, " might well be designed with a view to possible adaptation as a hospital in case of a serious emergency such as arose in 1918. Experience has shown how little is required to adapt a modern school building to hospital use, and a few minor variations in initial design, for instance, such as increased width of staircases to facilitate the handling of stretchers, would add very little to their initial cost and very much to their utility as emergency hospitals."

The author admits that the amelioration of the appalling housing conditions of the slums of Bombay is of the highest importance, but anticipates another outbreak of influenza before much progress can be made in this direction.

A. G. B.

i. BATES (Lewis B.) & ST. JOHN (J. H.). **The Bacteriology of the Influenza Epidemic on the Canal Zone, March-April, 1920.**—*Proc. Med. Assoc. Isthm. Canal Zone.* 1920. Jan.-Dec. Vol. 13. Pts. 1 & 2. pp.17–24. [1 ref.]

ii. CONNOR (Roland C.). **The 1920 Epidemic Influenza at Ancon Hospital.**—*Ibid.* pp. 79–92. With 2 charts.

i. The 400 patients from whom cultures were made were patients in Ancon Hospital. Media were used which gave optimum conditions for the recovery of *B. influenza*, the pneumococcus, and *Streptococcus haemolyticus* and routine blood cultures, nasopharyngeal and sputum cultures and autopsy cultures were made.

Conclusions :—

" 1. No one organism has been predominant in our cases. A variety of organisms has been recovered from lesions which were apparently the same, the appearance of the lesion being no criterion as to the organism present.

" 2. The *Streptococcus hemolyticus* has been found in but a small proportion of our cases and when found they were few in number and not widely distributed. We may safely say that the *Streptococcus hemolyticus* has played an unimportant part in this epidemic.

"3. The influenza bacillus has been recovered from 15 per cent. of the throats cultured during this epidemic; during an examination of 140 throats in this hospital made in February, 1919, this organism was not recovered. The increase in positive cases seems to be about equally divided between influenzae and non-influenza patients.

"4. The pneumonias in our fatal influenza cases seem to have been caused by a variety of organisms. In no instance were the lungs sterile and in most cases some of the organisms found in the upper respiratory tract were also found in the consolidated lung tissue.

"5. Although diffident about offering any opinion on account of the incompleteness of our work we quote the following paragraph of Cummins as stating our views at present:

"'The whole clinical and pathological picture becomes intelligible if we can postulate a primary etiological agent acting locally upon the respiratory surfaces and generally through its toxic products in such a manner as to prepare the way for invasion by the prevailing respiratory flora.'"

ii. The total admissions were 601, the deaths 33, or 5·4 per cent., pneumonias 52, or 8·6 per cent., of which 26 were fatal. There were 175 whites and 426 blacks; 251, or 41·7 per cent., were between 20 and 30 years of age. Autopsies were made in 27 instances. Conclusions reached were that influenza and its complications in the tropics are characteristically the same as in the temperate zone, and that the mortality from pneumonia is the same as in the U.S.A.

A. G. B

HOFFMANN (W. H.). **Das Blutbild der Influenza in den Tropen.**—*Muench. Med. Woch.* 1923. Sept. 21. Vol. 70. No. 38. p. 1199.

The author believes that in the tropics it is more usual to get a pure influenza infection than in temperate regions where other disease organisms cloud the picture. He has observed 55 cases in hospital in Havana, has made daily blood examinations, and believes that the changes described, which last at least a fortnight, are characteristic of the disease. Throughout there is a pronounced leucopenia. At first eosinophiles are absent, but with recovery they appear and soon are as numerous as 4 or even 8–9 per cent. There is now relative lymphocytosis. The Arneth index is at first high and then below normal. He claims that by these blood changes he can distinguish influenza from other tropical fevers.

A. G. B.

"HAEMOGREGARINES" IN MAN.

With reference to Dr. WENYON's article, "'Haemogregarines' in Man, with Notes on Some Other Supposed Parasites" (this *Bulletin*, Vol. 20, p. 543), in which CASTELLANI's *Toxoplasma pyrogenes* is discussed and the opinion given that it is not a protozoon but of vegetal origin, a letter has been received from Dr. CASTELLANI in which, referring to his paper (*Jl. Trop. Med. & Hyg.*, 1914, April 1, Vol. 17, pp. 113–4) he says:—"Some of the bodies depicted in rows 5 and 6 of the coloured plate in that paper may be nucleated micro-eritrocytes, but as regards the micro-photograph 3 and 4, and the bodies depicted in rows 2 and 3, I do not think there can be any doubt that they are parasitic protozoa. . . . Dr. Wenyon never saw the original preparations."

REVIEWS AND NOTICES.

MENSE (Carl). **Handbuch der Tropenkrankheiten. 3te Auflage. 1er Band.**—xviii+713 pp. With 341 text figs., 6 black-and-white and 5 coloured plates.—1924. Leipzig. Verlag von Johann Ambrosius Barth. [Price, Mks. 56; Bound, Mks. 60.]

i. Die Krankheitsüberträger und Krankheitserreger unter den Arthropoden (von Dr. Adolf EYSELL). [Arthropods as Transmitters and Producers of Disease.] (pp. 1–469. With 7 plates and 302 text figs.)

i. Of this huge volume no less than 469 pages, each containing between four and five hundred words, are devoted to arthropods of medical and sanitary interest. A great deal of it is bibliography, which is on a colossal scale, that of the Culicidae, for instance, occupying as many pages (63) as are given to the family itself in all its numerous essentials and including references to many papers that are of very little use to a medical man. In his treatment of the subject the author arranges arthropods in two categories, namely (1) those that transmit or disseminate pathogenetic organisms, and (2) those that are pathogenetic in their own properties. In the former category he includes ticks, lice, bugs, fleas, blood-sucking flies, Cyclops and some minor miscellanea; in the latter category Linguatulida, mites, spiders, scorpions, centipedes, dipterous maggots, stinging Hymenoptera and other urticating insects are included. In this arrangement the house-fly receives hardly sufficient attention and the louse perhaps a little too much. In the case of each natural group its pathogenetic importance, morphology, biology and taxonomy are duly considered and then such practical matters as prevention and control, capture, preservation, etc. The whole field is surveyed and a vast amount of information is provided. The book is generously illustrated, the number of figures in the text running to 302, in addition to which there are 6 coloured plates.

A. Alcock.

ii. Angewandte Blutlehre für die Tropenkrankheiten (von Prof. Dr. Victor SCHILLING, Berlin). (pp. 470–702. With 39 figs. & 4 plates).

ii. Some 10 years ago we had the pleasure of reviewing this considerable contribution to the study of tropical disease from the pen of the same author, who at that time styled himself Schilling-Torgau (see this *Bulletin*, Vol. 3, pp. 567–570).

The substance of the text, as well as the illustrations, are practically unchanged, and, as before, considerable space is occupied by the very extensive biliography. The addition of over 60 pages is accounted for by the insertion of new methods of blood examination, such as the dark-ground illumination, the practical application of the thick-drop method, Van den Bergh's reaction, etc. The high standard maintained throughout this section, as well as the exhaustive manner in which the subject is treated, has undoubtedly rendered Schilling's work the standard authority on tropical haematology.

P. H. Manson-Bahr.

LEAGUE OF NATIONS. Health Organization. **Interim Report on Tuberculosis and Sleeping Sickness in Equatorial Africa. Submitted to the Health Committee at its 6th Session, May 26, 1923.** [BALFOUR (Andrew), VAN CAMPENHOUT (E.), MARTIN (Gustave) & BAGSHAWE (A. G.).]—122 pp. With 12 maps.

The information collected in this report on tuberculosis and sleeping-sickness in tropical Africa is of such priceless convenience that the shortcomings of its outward furniture cannot but cause surprise: the valuable substance, in comparison with the style and appurtenance of its public presentation, shows "like some ore among a mineral of metals base." Considerations of expense may perhaps justify crowded lines and parsimonious margins, but nothing can excuse maps dumb of explanatory text and such carelessness in bibliography—where if there be inaccuracy confidence is apt to take flight at once and for ever—as assigns the authorship of the Royal Society's classical Sleeping Sickness Reports, along with several other papers of divers French and British origin, to ZUPITKA and a German source.*

The report on tuberculosis, which fills 28 pages, is an impressive summary of an ominous subject. The fullest and most accurate information comes from the French Colonies, where, thanks to the prescience of CALMETTE, who as early as 1911 realized the magnitude of an impending danger, the disease has been systematically investigated. The present authors, though paying due attention to the work of earlier observers, naturally draw largely on KÉRANDEL's report of 1922. Although KÉRANDEL does not accept the view that tuberculosis is a recent European introduction into tropical Africa, the disease seems to have become commoner since the European occupation and has increased considerably since the repatriation of native troops who served in Europe during the war—these evidences of increase being most apparent in Senegal, which is the oldest of the French possessions in Africa. In Senegal, too, as also in Dahomey, tuberculosis is known to exist among indigenous cattle. The influences at work in the propagation of infection among the native African communities are considered to be the same as in Europe, namely overcrowding, bad housing, and certain predisposing industries.

In the Belgian Congo tuberculosis is believed to have been non-existent at the beginning of the present century. In recent years, however, so many cases have been reported that copious and stringent preventive legislation has been instituted. Its spread seems to have been insidious, diseases that in lifetime had been treated as pneumonia and dysentery turning out to be acute pulmonary and intestinal tuberculosis. In accordance with established precedent the infection tends to run a rapidly fatal course in this virginal soil.

In the British Colonies there appears not to have been any systematic investigation of tuberculosis such as has been going on in French Africa —except in the case of the mandated territories formerly occupied by Germany, notably Tanganyika Territory, where PEIPER and MANTEUFEL attributed the diffusion of the disease in the first instance to Indians. For the British Colonies proper the authors have had to search the respective annual reports. From these it appears that tuberculosis is established in every colony, though it is said to be not common in Rhodesia and not much in evidence in Uganda; that its inception is generally ascribed to European intercourse, but in Zanzibar to Indians; that it probably is wider spread than is realized, many cases being undetected in lifetime, and that undoubtedly it is spreading; and that it is of a virulent type, working havoc in susceptible material. In Nyasaland it is said to be in process of dissemination by natives repatriated from the South African mines; in Kenya possibly by European invalids repairing to Nairobi in the most mistaken belief that the climate is specifically beneficial; and in Uganda by itinerant Bahima "cowmen." Some interesting information comes from the Anglo-Egyptian Sudan, where ARCHIBALD (in consonance with KÉRANDEL in French Africa) believes the disease to be of ancient origin, independent of Europe.

From the Portuguese possessions little direct information has been collected; but there is Portuguese medical testimony to the effect that tuberculosis is of frequent occurrence throughout Mozambique, particularly in Lourenço Marquez, and that it claims many victims in Angola, particularly in Loanda.

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* In justice to the Expert Committee it must be stated that no proofs were submitted to them by the League of Nations Secretariat.

One of the most instructive items of the Sleeping Sickness Report, namely the laboriously-compiled map exhibiting the exact distribution of the disease, is spoiled for lack of imaginative reproduction—but we will not harp upon the subject. Rather would we emphasize the comprehensive excellence of Dr. Gustave MARTIN's summary of the disease in its distribution and administrative treatment in the French possessions. In French West Africa the disease is localized in well-defined areas, this localization being explained by ROUBAUD as being dependent on a locally-varying susceptibility of *Glossina palpalis* to infection. In French Equatorial Africa, on the other hand, the disease is spreading like a plague, striking down all the members of a family as if it were " a family disease favoured by cohabitation " and spread by other biting insects ancillary to the primally-necessary tsetse-fly, and wiping out whole villages. Along the right bank of the lower Congo practically no traces of the aboriginal inhabitants remain. A great part of Dr. MARTIN's report is devoted to a description of the prophylactic measures that have been instituted. These vary according to local circumstances. In French West Africa, where the infection is limited, discomfiture of the fly by clearing and partial deforestation has been found efficacious, along with the restriction and regulation of traffic. In Equatorial Africa, where there are few areas completely immune from infection, sterilization of the blood of infected persons by trypanocide drugs is the principal aim. For this purpose the territory in question is divided into " prophylactic areas " each about equal in size to 4 to 6 French Departments, and each with its mobile medical staff. By systematic touring cases of sleeping sickness are detected and treated, the standard treatment (for adults) consisting in the injection of two doses of 1 gm. of atoxyl at an interval of 8 days--repeated when necessary. Besides detection and treatment of cases the duties of the itinerant medical officers include searching for the breeding-places of the tsetse-fly and suggesting such measures—partial deforestation, removal of villages, isolation of cases, etc.—as may tend to arrest the spread of the disease. It is an onerous task, the itinerant medical officers being always in the jungle and bereft of all the comforts of society and amenities of civilization. The work of the itinerant medical officers is supplemented by sanitary cordons and observation posts, and in isolation camps and other fixed stations where cases are methodically treated with atoxyl. The prophylactic service has at its disposal three central laboratories, where in addition to the study of trypanosomiasis in all its aspects the technical instruction of doctors and of European and native hospital assistants of the service is systematically carried on. The prophylactic service also keeps in mind the improvement of the general conditions of native life, the encouragement of settled cultivation, and the sanitary education of the native. As an illustration of the activity of this service it may be instanced that in the year 1921, 550,658 natives were examined and 28,589 cases treated from two to five times with a trypanocide in Equatorial Africa, and 7,061 cases were treated in the Cameroons. It is evident from this brief summary of Dr. MARTIN's interesting report, that the French authorities regard the prevention of sleeping sickness not at all as the reserved field of the entomologist or protozoologist, but as being (as in the case of malaria) a great matter of comprehensively-informed sanitary administration.

For its review of Sleeping Sickness in the Belgian Congo, the authors have relied on Dr. VAN CAMPENHOUT, whose map shows the distribution of the disease in that territory, indicating also its local waxing and waning, and who reports that of all the endemic diseases it is the widest spread, and severest. All the principles of prophylaxis—isolation, restriction of intercourse, quarantine stations and treatment, partial deforestation, settled cultivation, transplantation of villages—have in the course of time and experience been tried, and their several difficulties are here reviewed, but the method of detection of infected persons for sterilizing treatment with a trypanocide has gradually established itself as in the circumstances the most feasible and most efficacious. This treatment is carried out either in quarantine stations and other fixed centres, or by visits to villages. Medical officers are empowered to examine infected or suspected persons practically in any situation. Infected persons must submit to treatment, irrespective of nationality or sex. Suspected persons may be detained for observation. Persons in the late stages of the disease are to be isolated in hospital or quarantine station.

In dealing with Sleeping Sickness in British Colonies the authors have had a formidable task, which, however, has been facilitated by the existence of this *Bulletin* and its predecessor the *Sleeping Sickness Bulletin*, in which a large amount of authentic information is condensed. For this reason it is perhaps sufficient now to indicate that the Report, taking each Administration separately, gives brief résumés of recent observations in those colonies (Gambia, Sierra Leone, Gold Coast, Nigeria, S. Rhodesia, Kenya) where the infection is more or less quiescent and sporadic; some details of its distribution in Tanganyika Territory; much detail of its history in Uganda since 1912; and fairly copious detail of its discovery and progress in N. Rhodesia and in the southern confines of the Anglo-Egyptian Sudan.

A. Alcock.

MEDICAL RESEARCH COUNCIL. Privy Council, Special Report Series No. 38. (Revised.) **Report on the Present State of Knowledge of Accessory Food Factors (Vitamins) compiled by a Committee appointed jointly by the Lister Institute and the Medical Research Council.** 2nd Edition Revised and Enlarged.—171 pp. With 24 figs. 1924. London: H.M. Stationery Office. [Price 4s. 6d. net.]

Carefully considered reports upon such subjects as endocrinology, psychotherapy and vitamins are especially required at the present time. It is essential that these should be free from wild speculation and ill-considered optimism. For this reason alone the present report is to be welcomed by all those interested in the advancement of science. It is a model of impartiality and balanced judgment.

Much progress in the subject of vitamins has been made since the first edition of this monograph was published. Thus the subject of Pellagra has been banished from the present work. "The reason for the omission is that while pellagra must still be regarded as a disease of dietetic origin, no fresh evidence has been brought forward in support of that view, and the latest researches upon the subject point to a quantitative or qualitative defect in the protein of the diet as playing the chief part in the aetiology of this disease."

The animal organism is unable to synthesize vitamin A, the primary source of this factor being the green leaves of plants and marine algae. Xerophthalmia is described as an example of disease due to deficiency of this factor in the diet. It is typical of the careful attitude of the compilers that rickets is not discussed under this heading but receives a chapter to itself.

Vitamin B, or anti-neuritic vitamin, has for its chief sources cereals and edible pulses, in the former the largest deposit being in the germ or embryo. Eggs and yeast are rich in this substance, while the value of milk is debated. The vitamin content of milk varies of course with the cow's diet and at present experimental work on the value of this source has not given unanimous results. So far all attempts to isolate vitamin B have failed.

Concerning Vitamin C or anti-scorbutic vitamin, the authors state "the only important fact known about the origin of this vitamin is that it is produced during the germination of seeds." Experimental scurvy is fully described and splendid tables are presented throughout the work showing the exact value of all the common food stuffs as regards their content of all three vitamins.

Rickets is certainly of sufficient importance to warrant its discussion in a separate chapter. Recent work has proved that there are "two outstanding factors involved in the aetiology of this disease." These are (1) The presence of a vitamin resembling vitamin A in physical properties and in distribution, and (2) the degree of exposire to sunlight. The exact relation between the two A vitamins is well summed up in these words :—"In the present state of our knowledge the nomenclature of the fat-soluble vitamin or vitamins presents some difficulty if confusion is to be avoided. In this report the term vitamin A or fat-soluble A is used to denote the accessory food factor necessary to promote growth, and prevent and cure xerophthalmia (in rats) upon a diet adequate in all other respects. The term anti-rachitic vitamin is used to define a fat-soluble vitamin especially concerned with the calcification of bone. This would appear to have a similar distribution to vitamin A."

A valuable chapter is that devoted to the application of experimental work to the practical problems of human diets. In this connexion emphasis is laid upon the important fact that accessory food factors may be present in the diet in sufficient quantity to avoid the outbreak of deficiency diseases and yet not in sufficient quantity to prevent failure of nutrition and health.

Beriberi as it occurred in our troops in Mesopotamia and the Dardanelles was due to the deficiency of white wheaten bread not being counteracted, as in ordinary times, by a supplementary varied diet.

As regards the inferiority of lime juice to lemon juice in preventing scurvy it is pointed out that in the days when the former gained its great name as an anti-scorbutic measure it was not lime juice at all, but juice obtained from Mediterranean lemons, and it was only later that the West Indian lime came into vogue.

Interesting observations have been made regarding the incubation periods, if such a phrase be allowed, of vitamin deficiency diseases. The period of development of beriberi is from eighty to ninety days while that of scurvy is probably not less than four to eight months. "There is a certain amount of evidence showing that these periods of development may be shortened in case of men performing hard manual work or exposed to damp or cold climatic conditions."

The last chapter deals with the influence of diet on teeth, a subject of the greatest importance at the present time. There can be no doubt that the formation and calcification of the teeth and jaws are greatly influenced by the diet consumed during the growth period.

The Committee upon Accessory Food Factors appointed by the Medical Research Committee jointly with the Lister Institute have produced a report which is admirable in every respect and one which will be for a long time the standard authority. Not the least difficult and perhaps the most ably performed task has fallen to the lot of Professor HARDEN, who has edited the report on behalf of the Committee.

A. Douglas Bigland.

MACGREGOR (Malcolm E.). **Report on the Anophelinae of Mauritius, and on Certain Aspects of Malaria in the Colony, with Recommendations for a New Anti-Malaria Campaign.**—48 pp. With 4 maps, 2 plates and 33 figs. [Not on sale.]

This handsomely reproduced and finely illustrated report of a well-planned and well-executed anti-malarial survey of the island of Mauritius is full of interest. It is in two sections ; in one section are included all the details of the investigation, the differentiation and life-history and bionomy of the four local species of Anopheles in their adult and larva phases, and an account of their breeding places and of various influences operative on these ; the other section contains the practical suggestions for the control of these mosquitoes. It is proposed here to consider chiefly the first section, as dealing with facts of observation having something more than a local interest.

Prior to this investigation only three species of Anopheles were known to exist in Mauritius, and one of these was supposed to be rare; the author has ascertained that there are four species, namely *A. funestus*, *A. costalis*, *A. maculipalpis*, and *A. mauritianus*, and that all four are very abundant. The available natural breeding-grounds are many and varied—streams, swampy lakes, marshes, ponds, ditches, and flood-waters spilt on impermeable soil; numerous artificial breeding-grounds also are provided by the irrigation-works—reservoirs, channels, excess supply and overflow—of the sugar-plantations, and by the extravagant waste from water-pipes (running taps, etc.). It is noted that none of the Anopheles mentioned breeds in water having a definitely acid reaction.

The very careful survey of breeding-places led to the important discovery that *A. funestus*—a notorious nurse of malaria parasites in India and Africa—is extremely common in Mauritius. Possibly it had escaped the eye of previous explorers by reason of the secretiveness of its larva, which clings closely to covert in shaded waters, or possibly, as the author is inclined to assume, it may be a quite recent importation [the author has not realized that this is only one of a good many interesting and significant facts of zoogeographical distribution all capable of a common explanation]. Whatever be the explanation, the species has now been found all round the coastal fringe, and inland up to a height of 500 feet. The larvae occur in a variety of breeding-places, but never in open unshaded water; they prefer shady spots near the bank [as in Lower Bengal]. Another discovery is that *A. maculipalpis*, far from being rare, is really very common, occurring all round the coastal fringe and inland up to 1,200 feet. The fact that its larvae is indistinguishable from that of *A. costalis* by the unaided eye may account for its having been overlooked. Larvae of *A. maculipalpis* are restricted to seepage water; they may be found in such water even when it is but a film or fraction of an inch in depth and exposed to full sunshine. The adult, which is a malaria carrier, though apparently not of the front rank, goes into houses at night, but was never observed to be active in daytime. Of *A. costalis* it was ascertained that it does not hibernate, but dies down altogether in winter at elevations above 1,200 feet; below that level and on the coastal fringe it is sexually active all the year round. This species frequents houses at night, but is not to be seen in the daytime. It breeds in a variety of waters, both natural and artificial, provided they are not densely shaded; even when the water is partly shaded the larvae prefer the open sunny parts. Of *A. mauritianus* it was observed that it not only goes into houses, but also bites in the open at any time of day or night, and is extremely voracious, although insusceptible to infection with malaria. It breeds in all kinds of natural water,

As regards the effect of existing undesigned influences on the local breeding-grounds of Anopheles, it was discovered by actual observation that larvae were non-existent in streams receiving the effluent—often unpleasant also to human sense—from sugar factories. The homely operations of the dhobi (washerman) had the same inhibitory effect, even on water far down the stream. The influence of natural enemies was looked for, but in vain. Plenty of them—larvivorous fishes and predatory insects—are at work in all the natural waters of Mauritius: they play there their natural part in maintaining that well-apprehended, though subtle and veiled, balance of forces by which a mixed and varied assemblage of conflicting and competing species exist together in the state of nature as a harmonized organic whole. Man can upset this balance or can sweep it away altogether, but he can never be wise enough to control it "in being" for his own ends. The author understands this great natural truth, and he understands also that it in no way conflicts with the simple fact that in a purely *artificial* environment man can foster and utilize a particular species or class of animals for almost any purpose that he pleases; so that when in Mauritius he found, in their *natural* environment, great numbers of Anopheline and Culicine larvae living in the same natural waters with numbers of larvivorous fishes he felt no surprise, but rather a welcome confirmation of orthodox biological views.

This section of the report also contains an account of a five-days' survey by the author and two skilled coadjutors of Rodriguez, an inhabited island 42 sq. m. in extent and 1,700 feet in maximum elevation, lying 365 miles E. by N. of Mauritius. The island is encompassed by a barrier reef, so that vessels must lie at least a mile off shore, and this circumstance is held to account for the absence of Anopheles by importation. The island is about 10 miles long and has streams in every valley, and swamps and marshy pools on the coastal fringe. In all these natural waters larvae of *Culex fatigans* and *C. simpsoni* were to be found in enormous numbers. The only other species encountered was *Stegomyia fasciata* (= *Aëdes argenteus*), breeding in all the tree-holes, both in the coastal flats and inland up to 800 feet. The author's party made careful search of 26 streams and their associated pools and marshes but could not find any Anopheles larvae. It is interesting to note that in the same search no kind of larvivorous fish could be found. Anopheles, in short, would have been said to be non-existent in Rodriguez but for the fact that an officer once stationed in the island had mentioned having seen it. Attempts to get to the bottom of this statement have not brought explicit confirmation, and extensive collections made recently by another resident officer during about six months have produced nothing but the three species of Culicini mentioned above. The author mentions that chiggers are extremely common in Rodriguez and also that he saw a case that he surmised to be elephantiasis.

The second section of the report, containing well-reasoned recommendations for abolishing Anopheles from Mauritius, prescribes no new principles and is of merely local interest. The author adopts unreservedly the view, pardonable in an enthusiastic entomologist but not so easily and finally acceptable to those who pay due regard to all the facts of history, that the abolition of malaria is purely an entomological problem.

A. Alcock.

BALFOUR (Andrew) [C.B., C.M.G., Director, London School of Hygiene and Tropical Medicine] & SCOTT (Henry Harold) [M.D., M.R.C.P.Eng., London School of Hygiene and Tropical Medicine]. **Health Problems of the Empire. Past, Present and Future.** [No. 5. The British Empire Series. Edited by Hugh GUNN.]—pp. xxi+413. With 9 illustrations. 1924. London: W. Collins & Co., Ltd., 48, Pall Mall. [Price 16s. net.]

Under the heading of Health Problems the authors have given us a bird's-eye view of the sanitary history of the countries that compose the Empire, a clear account of some of the diseases that are most notoriously hurtful to the resources of the Empire, and an instructive and philosophical disquisition on such imperial responsibilities and burdens as maternity and child welfare, alcoholism, and the drug habit. The book will be reviewed at some length in Sanitation Supplement No. 2 (June 30, 1924). Unlike most books on hygiene, it is full of interest and inspiration. It is a book that every medical man who intends to practise in the overseas dominions should possess.

A. Alcock.

TROPICAL DISEASES BUREAU.

TROPICAL DISEASES BULLETIN.

Vol. 21.] 1924. [No. 7.

LEPROSY.

HASSELTINE (H. E.). **Studies upon Leprosy. XXXIV. Further Statistics of Leprosy in Hawaii.**—*U.S. Public Health Service. Treasury Dept. Public Health Bull. No. 130.* 1922. Dec. pp. 1–11.

This paper continues the records of *Public Health Bulletins* Nos. 33 and 66 from 1913 to 1921 inclusive, the numbers of admissions in the last year being double that of 1913, owing to a number of lepers having recently surrendered voluntarily to obtain the improved treatment—a most satisfactory feature. In spite of this the average annual incidence per 1,000 population has fallen from 0·45 for the decade 1902 to 1911 to only 0·33 per mille during the last ten years, showing that the incidence is gradually lessening. The table of the ages of the lepers shows that 40 per cent. entered segregation before reaching the age of 21, and another 36 per cent. between the ages of 21 and 36, leaving only 24 per cent. in the latter half of life. Association with lepers before segregation was admitted in 48 per cent. of the 665 cases, the most frequently infected relatives in order of frequency being brother or sister 110, father or mother 67, uncle or aunt 56, cousin 28, friend 26, grandparent 19, and son or daughter 13. The duration of the disease before segregation was within one year in 193 of the 665 cases, or nearly one-third, within two years in 311, or nearly one-half, so that over one-half the cases had over two years in which to infect others before they were segregated ; this, it is pointed out, is due to hiding of cases, which " has done much to reduce the power of segregation in the prevention of the disease." Since the introduction of injections of soluble preparations of chaulmoogra oil in the treatment it has been found that early cases yield to treatment more rapidly than those of long standing, and when this becomes generally known " it may be predicted that a reduction in the incidence of leprosy greater than ever seen in these islands will become evident." Since a number of recovered cases have been discharged on parole the proportion of lepers coming within the first two years of the onset of the disease has risen materially, and one released man brought his daughter in an early nodular stage, six weeks' treatment of whom removed the nodules and the bacilli.

L. Rogers.

HASSELTINE (H. E.). **Studies upon Leprosy. XXXV. Statistical Report on Cases of Leprosy which have left Segregation on Parole.**—*U.S. Public Health Service. Treasury Dept. Public Health Bull. No. 130.* 1922. Dec. pp. 12–24. [12 refs.]

This report on the results of paroling apparently cured or non-infective lepers is of great interest. Since 1912 up to the end of 1921 249 were released, but the average number set free annually up to 1918 was only 11, while during the last three years, as a result of the improved treatment, the average discharges were 57. Europeans had a slightly higher discharge rate then other races; approximately 30 per cent. of those entering segregation have been paroled. The paroled include more females than males in proportion to their numbers, while the percentage decreased with the rise of age from the lowest ages up to 26 to 30 years, after which there is a slight increase owing to the number of chronic nerve cases long in residence, so that the younger lepers have the more favourable outlook. The duration of the disease on first being segregated has a considerable influence, 33 per cent. of those of under one year's duration and 25 per cent. under two years, 21 to 24 per cent. of those of from 2 to 5 years' duration having been paroled, against 11 to 13 per cent. of between 5 and 7 years' duration. Longer cases, who represent the survival of the fittest, which include many chronic nerve ones, in which the infection has died out leaving the patients much crippled, again show higher rates of release. The percentage of recurrences was also lowest in those who had been affected less than a year on admission, again showing the better prognosis in early cases, leading the author to conclude that " the early recognition and treatment of leprosy is the point on which most emphasis should be placed." Thus of those affected less than a year 1 in 3 was paroled, in 1 to 2 year old cases 1 in 4, in 3 to 4 year cases 2 in 9, in 4 to 5 year cases 1 in 5 and of those having the disease 5 to 6 years only 1 in 10 was released as having become uninfective.

The duration of treatment table shows that nearly 70 per cent. of the paroled were in segregation less than two years and about 10 per cent. over 10 years, while of 168 paroled cases treated less than two years 17 per cent. relapsed, and of 74 treated over two years 14 relapsed. With regard to the type 73 out of 143 anaesthetic, 108 out of 382 nodular, and 30 out 119 mixed cases were paroled, so in proportion to the admissions more nerve than nodular ones were released, the nerve form being generally recognized as the mildest and least fatal. It is significant that in the earlier years no nodular cases were paroled, but with the improved treatment they are clearing up in numbers. On admission 157 of the cases were bacteriologically positive; these had all become negative before release. Experience has shown that recently " the requirements for parole became less rigid and possibly too lenient," but much good has been done by thus teaching the public " that the disease is amenable to treatment and that the life in segregation is far better than the usually gloomy picture so often painted in books and magazine articles. This has caused a considerable number of lepers to surrender themselves and receive treatment, thereby removing dangerous cases from the community." Repeated bacteriological examinations will be made before release in future, when it is hoped relapses will be less frequent.

L. R.

NEW SOUTH WALES : Leper Lazaret. **Thirty-Second Report on Leprosy in New South Wales, for the Year ended 31st December, 1922.** [MILLARD (R. J.), Med. Supt.]—*Report of the Director-General of Public Health New South Wales for the Year 1922.* pp. 94–101. (1923. Sydney: Alfred James Kent, Govt. Printer.)

On 1st January 1922 there remained 22, there were 3 admissions, including one escaped leper from the Queensland Lazaret, 2 died and 2 were discharged, one as recovered after treatment with sodium morrhuate and chaulmoogric esters, and one returned to Queensland; 21 remained at the end of the year. The usual tables and details of the cases are given with dates of admission, but no record of the duration of the disease. Chaulmoogra oil and hydnocarpates internally, sodium morrhuate injections during the first half of the year, oscol stibium and for the last two months E.C.C.O. treatment have been given, but no opinion of their value is recorded, the notes showing very little improvement in most of the cases. Half of the patients had been segregated 10 or more years, and three-fourths 5 or more, so the duration of their disease must have been considerably longer.

L. R.

BOURGIN, DECROP & SALLE. **Endémie et prophylaxie de la lèpre au Maroc.**—*Congrès de la Santé Publique et de la Prévoyance Sociale Marseille, 11–17 Septembre, 1922. Comptes Rendus.* pp. 137–142.

Leprosy is widespread in Morocco, 7 nodular, 16 nerve and 13 mixed cases having been seen in Fez during 1920. In the middle ages the disease was epidemic. Its contagiousness is undeniably through intimate contact leading to inoculation of abrasions of the skin, slight unrecognized cases being sometimes sources of infection, while some persons appear to be immune, as in the case of a woman who had 23 leper lovers, but escaped the disease. The authors advise leprosaria for town lepers, for the more contagious nodular cases and those discharging the bacilli from their noses; and in the villages compulsory notification, the prohibition of certain trades and the creation of institutions for looking after the infirm and recalcitrant lepers.

L. R.

NIGERIA : Medical Research Institute. **Report on the Lepers at Yaba Asylum after Six Months' Treatment by the Method Suggested by Harper** [by YOUNG (W. A.), Assistant Bacteriologist].—*Ann. Rep. on the Med. Research Inst. for the Year 1922.* pp. 36–38. (1923. Lagos: Govt. Printer.)

This is a report on six months' treatment of the lepers at the Yaba Asylum by Harper's method of intravenous injections. Other methods were often objected to by the patients on account of the pain following intramuscular injections, including moogrol. They preferred the daily intravenous injection of 10 to 12 minim doses of moogrol 500, ether 500, and iodine 1 part, although it caused immediate strong coughing, and was followed by febrile and local reactions and leucocytosis. In some cases it was difficult to find sufficient veins to continue them for long, and in time the injections became more painful on this account; after three or four months all but one asked to return to the muscular injections. These in turn were objected to, and finally a mixture of moogrol, iodine to give a distinct brown colour, with chalk and water to make an emulsion, was given up to 10 drachms daily, a day or two's rest being given if they reacted. At the time of reporting all the cases were still positive bacteriologically, the ulcers were healing or had healed, and they felt better, while three had shown great improvement, but an early nerve case was unchanged. The results are considered encouraging, but longer time is necessary to allow of the value of this treatment being decided.

L. R.

BRITISH GUIANA : [(a) **Report on Public Leper Asylum, Mahaica, E.C., Demerara.** (b) **Extracts from Dr. Frendo's Special Report on Moogrol Treatment, Leper Asylum.**] [FRENDO (J. A.), Med. Supt.] —*Report of the Surgeon General, British Guiana, for the Year 1922.* pp. 28–32. (1924. Georgetown : "Argosy" Co., Ltd.)

There were 248 lepers in the asylum at Demerara on January 1st 1922, 96 admissions and re-admissions; 29, or 8·4 per cent., died, 39 were discharged or absconded and 276 remained at the end of the year. The average number of lepers was 277. Moogrol treatment was used. Only a few slight febrile reactions were observed; in several cases nodules broke down followed by healing, while ulcers may heal at the same time. No toxic symptoms were observed. Photos showed facial improvement following absorption of nodules, trophic ulcers also healed in some nerve cases, and discoloured anaesthetic patches disappeared with partial recovery of sensation in some, while in many cases muscular tone was improved. The conclusion is reached that improvement was noticed in several cases, but it is too early to say if it will prove permanent. Apparently moogrol is the most hopeful drug and its use should be continued.

L. R.

DE ALMEIDA (Ribeiro). **A'Margem do Problema da Lepra.**—*Sciencia Medica.* Rio de Janeiro. 1923. Dec. 31. Vol. 1. No. 6. pp. 275–277.

According to the latest statistics there are 5,000 lepers in S. Paulo, amongst a population of five million, and the accommodation for them is obviously inadequate, comprising only 34 small leprosaria scattered throughout the State. The writer recommends the construction of four or five more, built on the type of the "Model Leprosarium" of S. Paulo, and the passing of laws for compulsory notification and segregation.

H. Harold Scott.

CAPUTO (Vincenzo). **La Lepra in Calabria—un caso di lepra tubercolare. Contributo terapeutico.**—*Giorn. Ital. d. Malattie Veneree e d. Pelle.* 1923. Oct. Year 58. Vol. 64. No. 5. pp. 1126–1132. With 1 plate. [27 refs.]

Leprosy in Calabria is probably imported by returning emigrants, chiefly from America. Cases are not numerous. In Cariati (Province of Cosenza) amongst 4,000 inhabitants there have been about 20 since 1890. At the present time there are only two. In Longobucco, in the same Province, with 7,000 inhabitants there is but one case ; in Crucoli (Catanzaro) four cases have been reported amongst 3,000 inhabitants. The author gives a detailed account of a severe case, a man aged 48 years, who appears to have contracted the disease from his uncle, a leper, with whom he had been closely associated. Various forms of treatment were adopted between the years 1919–1922, including 138 injections of chaulmoogra oil, 20 of them intravenous, totalling 375 cc. of the preparation. He also had 18 injections of cacodylate of sodium, the maximum dose being 5 cc. There was no appreciable benefit derived from all this, and for 18 months the patient stopped all treatment. He then returned in a much worse condition, and Antileprol (Bayer) was tried. It was given by mouth in capsules containing 0·5 gm., the maximum dose being 5 gm. and the total 125 gm. He also received intramuscular injections, 5 per cent. in cycloform, maximum dose 5 cc., total 150 cc. Improvement was marked, nodules disappeared and the bacilli seen on histological examination of nodules diminished, and the vision also improved. Iridectomy was performed and the patient left with vision 2/10, and he was able to resume his work as a trader.

H. Harold Scott.

ROGERS (Leonard). **The Incubation Period of Leprosy.**—*Indian Med. Gaz.* 1924. Feb. Vol. 59. No. 2. pp. 65–68.

The vexed question of the length of the incubation period of leprosy is dealt with in a scientific manner. The importance of a decision upon this is inestimable, for treatment, if it is to result in cure, must be begun early. The incubation period has been variously stated to be from one year or less to ten years or more, the longer periods being probably due more to latency, or to the overlooking of slight symptoms, especially in the anaesthetic form, than to actual unduly prolonged incubation; but the author here has proceeded from definite facts and shows that the period depends very largely on the mode and length of exposure to infection; in other words, on the dose of the virus and the frequency of its repetition. Under conditions of direct inoculation, incubation may be as short as six months; with close contact, such as sleeping in the same bed as a leper, the average period is twenty months; with less intimate contact, such as would arise amongst those dwelling in the same house, it proves to be a little under three years; lastly, where contact is less close still, mere association, as, for example, where children are allowed to play with an infected child, five years may be regarded as an average. The practical bearing of the investigation is that known contacts should be kept under observation and examined periodically in order to ensure early detection of the disease and timely initiation of treatment.

H. Harold Scott.

MUIR (E.). **Report on Leprosy Research.**—*Ann. Rep. Calcutta School of Trop. Med., Inst. of Hyg. and the Carmichael Hospital for Tropical Diseases for the Year 1923.* pp. 35–37.

Tests are reported of the comparative efficiency of hydnocarpus esters, those made from oils not having the properties of the chaulmoogra group of rotating polarized light, and also those made from coconut oil with little unsaturated fatty acid, such as those prepared from linseed oil, and the conclusion is arrived at that although the linseed has a definite effect in leprosy, the chaulmoogra preparation gave decidedly better results, indicating that the beneficial effects of hydnocarpus and chaulmoorga oils partly depends on the carbon ring group peculiar to this series, and partly to their unsaturated fatty acid as a class. Thymol, as advised by Sumatra workers, has also proved beneficial, but further experience is needed on this point. External applications of trichloracetic acid to the leprous lesions has resulted in rapidly clearing up the lepromata of the skin in many cases. Potassium iodide internally often enables beneficial reactions to be obtained with ethyl esters in comparatively small doses, so injections of 50 per cent. hydnocarpus esters in pure olive oil are advised to contain 10 per cent. of thymol in gradually increasing doses, together with a local application by a glass rod covered with cotton wool of 20 to 30 per cent. of trichloracetic acid in distilled water at intervals of 7 to 14 days.

The most encouraging results are obtained in early cases, and experience shows that leprosy can almost always be diagnosed clinically long before it has become infectious, as shown by negative results of bacteriological examinations in early cases. " We have further found that most early cases lose all signs of active disease within a few months if they remain regularly under treatment and comply with instructions given with regard to sanitation, diet and general habits. The most hopeful method of dealing with leprosy must therefore depend on early diagnosis and early treatment. To carry this out dispensaries are essential, which must be situated within easy reach of the patients and conducted by medical men who are well qualified to diagnose and treat leprosy."

L. R.

Muir (Ernest). **Leprosy a Self-healing Disease.**—*Lancet.* 1924. Feb. 9. pp. 277–280. With 2 figs. [4 refs.]

The tendency of leprosy to undergo spontaneous recovery, pointed out by Hansen and others, is due to a very slow and gradual production of immunity to the lepra bacillus, aided by the fact that, unlike tubercle, vital tissues are not affected and death nearly always results from complications. The enormous numbers of lepra bacilli present in nodular cases, without necessarily any great impairment of general health, shows its low toxicity. The course of leprosy shows a curve with few bacilli and low immunity in the first stage, many bacilli with still low immunity in the second stage of rising curve, and a third stage of descent with increasing immunity and resolution and disappearance of the lesions and bacilli, although not until great damage, deformity and crippling have been produced. Both animals and man when in good health show great resistance to infection, a resistance-lowering disease, such as chronic bowel disease, syphilis, etc., often preceding the outbreak of leprous lesions. The leprous lesions also show three stages: firstly, the quiescent phase with multiplying bacilli, but little toxaemia; secondly, the reactionary phase with setting free of toxins and inflammatory reaction in the lesions accompanied by fever, during which the bacilli show granular staining and breaking up, affecting a variable proportion of the lesions; and, thirdly, the stage of resolution with subsidence of the inflammatory reaction and gradual disappearance of the thickening of the tissues and of the lepra bacilli. Different lesions may show the various stages at the same time with spreading in one part and clearing up of another area. During the reactionary stage bacilli as well as toxins may be set free with the formation of small inflammatory nodules, which may quickly disappear again if some immunity has been established.

These stages are of great importance in regard to treatment, as in the first stage of low immunity any depressing conditions should first be removed; antigens, such as possibly defatted acid-fast bacilli, to increase the immunity, and the fatty acids of hydnocarpus and chaulmoogra oils are of value, combined with counter-irritation by infiltrating the ethyl esters into the subcutaneous tissues under the skin or nerve lesions or by the external application of a 1 in 3 solution of trichloracetic acid in distilled water painted on every six to ten days. In the second stage the same remedies should be used, especially the esters of the fatty acids, with special caution to avoid inducing severe reactions, while trichloracetic acid is now of great value. In the third stage with a fair degree of immunity all the above remedies may be pressed, as considerable reactions are generally followed by marked improvement, and there is far less danger of an increase of the disease than in the second stage, large injections of the esters of the fatty acids being given, and if sufficient reaction is not induced iodide of potassium should be given internally, beginning with half a grain daily, and increasing until reactions are induced or the patient's tolerance is reached.

The prognosis is improved by the fact that leprosy tends to be a self-healing disease, and when the third stage is reached there is little chance of recurrence, and if negative bacteriologal examinations have been obtained over a period of two years in this stage, the leper may be considered cured, but a similar condition during the first and second stages should be considered one of relative cure, and any condition lowering the general resistance may be dangerous. Experience is required in recognizing the different stages, which are not clear cut, but any case advanced to the borderland of the third stage may be treated as one in that stage. The object of treatment is to cut short the disease in the first or second stages and to hasten resolution in the third by causing moderate reactions.

L. R.

i. IMPEY (S. P.). **Leprosy.** [Correspondence.]—*S. African Med. Rec.* 1924. Feb. 9. Vol. 22. No. 3. pp. 63–64.

ii. KIDD (Leonard J.) & iii. SHAW-MACKENZIE (J. A.). **Leprosy: a Self-Healing Disease.** [Correspondence.]—*Lancet.* 1924. Mar. 1. p. 464, and Mar. 8, pp. 517–518.

i. Impey writes, in reference to MUIR's paper on Leprosy: A Self-healing Disease, to point out that as early as 1894 he drew attention, in an essay published by the New Sydenham Society*, to the frequency with which leprosy infection dies out, especially in the nerve form, rendering the leper no longer infective or in need of segregation.

ii. Kidd mentions having been shown by Dr. KAURIN in Norway in 1891 a healthy girl who had recovered from leprosy spontaneously.

iii. Shaw-Mackenzie writes once more to draw attention to his former paper [see this *Bulletin*, Vol. 18, p. 391], pointing out that sodium chaulmoograte, morrhuate and oleate stimulate the fat-splitting action of lipase, and may account for the effects of these substances on the bacilli of leprosy and tuberculosis. [See *Brit. Med. Jour.* July 7, 1923 for a paper by ROGERS on this point and in which Dr. Shaw-Mackenzie's work is referred to.]

L. R.

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* IMPEY (S. P.) On Spontaneous Recovery from Leprosy.—*New Sydenham Society.* Vol. 157. 1895. pp. 209-226.

MONRAD-KROHN (G. H.). **The Neurological Aspect of Leprosy ("Spedalskhed")** (Vid.-Selsk. Skr. 1.M.-N.Kl. 1923. No. 16.) —78 pp. With 39 text figs. 1923. Christiania : On Commission by Jacob Dybwad.

This valuable monograph gives a lucid and well-illustrated account of the nerve form of leprosy based on minute examinations of 63 Norwegian cases and a knowledge of the literature of the subject. The pathological anatomy of the nervous system in leprosy is first briefly reviewed, and emphasis laid on the lesions being essentially due to an ascending neuritis due to lepra bacilli in the peripheral parts of the nerves, while in advanced cases the spinal ganglia and the posterior columns of the spinal cord may show secondary degenerative changes.

Of the cranial nerves the sensory portion of the fifth and the seventh are most affected, the different qualities of sensation being equally diminished as a rule, the frontal and supraorbital nerves sometimes showing visible thickening. The facial nerve frequently shows a characteristic involvement of its peripheral portion, especially the muscles of the upper part of the face, producing ectropion of the eyes, usually bilateral, and of the supraoral muscles with dribbling of saliva and difficulty in pronouncing labials, while lagophthalmus is very common ; facial paresis or paralysis has been found in 69·5 per cent. of his cases, while a portion only of the face muscles fail to respond to the faradic current. The other cranial nerves are rarely affected.

Motor disturbances begin in the distal parts of the limbs and spread slowly to the more proximal parts, being essentially due to a peripheral neuritis, producing the claw and the simian hand, but not extending above the forearms, and corresponding parts of the lower extremities. Coordination is seldom affected and never to any great degree.

Sensory disturbances begin with hyperaesthesia, neuralgia often bringing the patient to the doctor, and go on to hypaesthesia. Here again the different qualities of superficial sensation are as a rule affected to approximately the same extent, for although all kinds of dissociations are met with they are never complete. In maculo-anaesthetic leprosy the anaesthesia corresponds more or less to the areas of the macules, but are more pronounced on those of the limbs than on the trunk. A number of charts of the distribution of the loss of the sensations of touch, pain and heat and cold are given. On the other hand, deep sensation and joint sense are well preserved. Thickening of the nerves was most frequently found in the following order, ulnar, great auricular, tibial behind the internal maleolus, supraorbital, peroneal according to LAEHR. The deep reflexes are little affected ; vasomotor disturbances appear as coldness and cyanosis of the hands and feet ; anidrosis is frequent in the anaesthetic areas and can be brought out by pilocarpine, glossy skin, pigmentations and depigmentations, pemphigus, loss of hair, perforating ulcers, dry necrosis and concentric atrophy of the bones of the fingers and toes are the result of secretory and trophic disturbances, but the nails are often preserved in spite of atrophy of the small bones. Mental changes chiefly occur as depression or persecutory delusions.

The diagnosis of nerve leprosy is commonly helped by the presence of skin lesions, but may be difficult in their absence, and depends mainly on the presence of an ascending polyneuritis, the presence of partial facial paralysis already described, thickening of nerve trunks and the absence of incoordination and other spinal cord symptoms, which serve to differentiate it from syringomyelia, progressive muscular atrophy, amyotrophic lateral sclerosis and other diseases of the cerebro-spinal axis, which may in some respects resemble it.

L. R.

UNNA Jr. (Paul). **Beitrag zur Frage der tuberkuloiden Lepra.**—*Virchows Arch. f. Path. Anat. u. Physiol.* 1923. Vol. 246. pp. 253–261. With 1 fig. [29 refs.]

After describing in detail a case of nodular leprosy with a few anaesthetic patches, some theoretical matters are considered regarding the pathological differences between the tubercles of leprosy and of tuberculosis, and the author concludes that the reaction is in proportion to the number of the bacilli and that different stages of the disease are met with in the same subject. He obtained negative results in experiments on monkeys, and refers to KYRLE's work, in which he inoculated monkeys with leprosy nodules and made sections of portions of the skin removed at intervals of 35 days and found in the first piece proliferation of the epithelioid cells and the formation of lepra-vacuolated large cells containing numerous acid-fast elements; in the later section there were small nodules of epithelioid cells, very few giant cells and no acid-fast bacilli, but very numerous small round cells resembling nodules of tuberculosis, the lepra bacilli having now been destroyed owing to the resistance of monkeys to the infection, from which they recover.*

L. R.

GOMES (Emilio). **Sobre a transmissão da lepra pelos mosquitos.**—*Brazil-Medico.* 1923. Dec. 29. Year 37. Vol. 2. No. 26. pp. 379–381.

A brief review, mainly historical, of the transmissibility of leprosy by insects. The author concludes that the mosquito is the sole transmitter on the grounds that: 1. Cases are met with in which no contact can be traced; 2. Leprosy occurs only in countries where there are mosquitoes; 3. Rigorous disinfection and isolation will not prevent healthy subjects in the vicinity from becoming leprous unless anti-mosquito measures are also taken in hand.

H. Harold Scott.

HENRY. **Note sur un case de lèpre.**—*Rev. Méd. et Hyg. Trop.* 1924. Jan. Vol. 16. No. 1. pp. 26–27.

The interest of this case is that it commenced in a child aged three years, who had been separated from his leper parents two months after birth, his grandparents also having been lepers. The first sign was a red patch on one thigh noticed in November 1922, which in January had become larger and now showed anaesthesia, and two further patches had appeared on the limbs. The exposure to infection was therefore only two months and the incubation period three years.

L. R.

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* *Frankfurter Zeitschr. f. Pathologie.* 1916. Vol. 19. heft 1/2.

MUIR (E.). **Nerve Abscess in Leprosy.**—*Indian Med. Gaz.* 1924. Feb. Vol. 59. No. 2. pp. 87–89. With 2 figs.

The writer has met with two cases of abscesses forming within the greatly thickened nerves of leprosy, and he gives illustrations of such a case affecting the medial cutaneous nerve just above the elbow, and forming a tumour the size of a pigeon's egg, which was found on incision to contain yellow pus free from organisms demonstrable microscopically or by injection into guineapigs. A little higher up in the nerve was another small cavity connected with the first one, while there was typical anaesthesia and alteration in the colour of the skin in the distribution of the nerve, leaving no doubt regarding the diagnosis. He has seen another similar case with four nodes on the ulnar nerve, the lowest of which was found to contain pus. He is not aware of any similar record.

L. R.

TRAVERS (E. A. O.). **The Treatment of Leprosy at the Leper Asylum, Kuala Lumpur, Selangor.**—*Fifth Congress of the Far Eastern Association of Tropical Medicine*, Singapore, September, 1923.

The ethyl esters prepared from *Hydnocarpus wightiana* oil in MUIR's E.C.C.O. mixture was used in 37 cases, of which 27 had been treated for the full twelve months, all being bacteriologically positive nodular or mixed cases. Of these 10 had improved, 11 not improved and 6 were worse, the number of injections having varied from 20 to over 50. In most the improvement was slight, although in one case of only three months' duration it was very great, but, on the whole, the results were disappointing, and women and children object to the pain of the injections.

On the other hand, the writer noticed remarkable improvement in several lepers who treated themselves with a Chinese preparation of chaulmoogra nut combined with two other drugs, nine cases being tabulated, of which five were found to be negative bacteriologically by Dr. STANTON. The preparation was found to consist of 2 parts of chaulmoogra nut (*Taraktogenus kurzii*), 1 part of hemp seed steamed and dried and ground as fine as possible, and 1 part a Chinese seed (Pak Chut Lai). Only well preserved nuts should be used, and not rancid ones, to avoid stomach trouble, and the writer suggests that in extracting the oil some important substance in the nut may be left behind. Since April 4th, 1923, some eighty lepers have been treated by this preparation, given orally in doses beginning with 15 grains twice daily and increased to 30 grains twice a day without severe gastric trouble. The treatment is popular, women and children taking it readily, while the cost is low, only thirty dollars a month for eighty cases, and a large number of cases have shown healthy reaction and decided improvement. In ulcerated cases 0·5 to 1 grain of tartar emetic intravenously resulted in complete healing of the ulcers in 13 cases, improvement in 8 and no effect in 10 cases, but no benefit was produced in unulcerated lesions. Most asylum cases are too advanced on admission to allow of much hope of recovery, so the public should be educated to recognise the early signs of the disease, and the paper concludes with the following hopeful statement: " When it is generally understood that, if taken in time, the progress of the disease can be arrested and that in a large proportion of cases leprosy can actually be cured, there is no doubt that the lepers will come for treatment directly they realize that they are afflicted with the disease. The importance of this cannot be too greatly emphasized, and I am convinced that when we are in a position to treat leprosy from an early stage we shall be able definitely to cure the disease."

L. R.

Robineau (Marcel). **Le traitement de la lèpre dans les leproseries d'Ebolowa, Yedjang, Ngalan.**—*Congrès de la Santé Publique et de la Prévoyance Sociale, Marseille, 11–17 Septembre, 1922. Comptes Rendus.* pp. 142–154.

This paper deals with work already reviewed (see Vol. 20, p. 822, of this *Bulletin*), but gives some further details regarding the results obtained by the use of aiouni and eucalyptol, chaulmoogra oil, and of atoxyl and arrhenal consecutively, all intramuscularly, in a series of cases. In 30·9 per cent. of 42 macular cases complete disappearance of the disease was obtained, but in 35 maculo-atrophic cases only retrogression of the symptoms was got in 29 cases. Of the 13 recovering cases 11 were females.

L. R.

Maples (E. E.). **Treatment of Leprosy.**— *Nigeria Ann. Med. & San. Rep. for the Year 1922.* pp. 31–32.

The results of treatment at the Native Hospital, Calabar, are recorded, sodium gynocardate having been used intravenously, but no definite conclusion has been arrived at, " although the cases seem to be improving, and declare that they feel much better generally." One early nodular case treated by this and other methods for four years has been bacteriologically clear and free from all symptoms for two years and " to all intents and purposes he appears to be cured."

On page 51 it is reported regarding leprosy that " The long contemplated movement against this widespread indigenous infection has not yet been materialised and there is little immediate prospect of any change."

L. R.

Parra (Ricardo F.) & Santos (Jorge E.). **Un año de tratamiento de la lepra por los esteres etílicos de los ácidos grasos del aceite de chaulmugra en Agua de Dios. (Colombia.)**—*Repert. de Med. y Cirug.* Bogotá. 1923. Dec. Vol. 15. No. 3. (No. 171). pp. 124–137.

This paper, with its appended tables, constitutes the report on the first year's employment of the ethyl esters of unsaturated fatty acids of chaulmoogra in the treatment of leprosy in Agua de Dios (Colombia). 700 patients have been under observation and treatment. The doses given varied from 1 to 15 cc., but experience has shown that 6 cc. is the maximum well tolerated in weekly injections. With larger doses untoward symptoms appeared, in particular dyspnoea, cough, laryngeal spasm and burning pain in the chest. Many patients have shown marked improvement both in their general state and in the local manifestations. The bacilli in the latter became fewer in number and fragmented. The authors find this preparation far more satisfactory than the oil itself or any of the derivatives hitherto tried. In the tables brief notes are given of 125 patients treated in different district hospitals, but, as the authors state, it is too early yet to expect very definite results.

H. Harold Scott.

i. SCHÖBL (Otto). **Chemotherapeutic Experiments with Chaulmoogra and Allied Preparations.**—*Philippine Jl. Sci.* 1923. Dec. Vol. 23. No. 6. pp. 533–542. [4 refs.]

ii. ——. **Chemotherapeutic Experiments with Chaulmoogra and Allied Preparations. . II. Comparison of the Antiseptic Power of Chaulmoogra Oil with that of Other Vegetable and Animal Oils, Rare and Common.**—*Ibid.* 1924. Jan. Vol. 24. No. 1. pp. 23–27. [1 ref.]

i. This paper affords important confirmation and extension of the work of WALKER and SWEENEY on the action of chaulmoogra soaps on acid-fast bacilli in vitro in fluid media. Measured amounts of the oils were added to 10 cc. of 5 per cent. glycerine agar, which was then inoculated with a human tubercle bacillus, and the tubes were compared with control tubes after various periods of time to note any inhibition of growth, liquid paraffin and olive oil being added to other tubes for comparison. The tables show a specific action of the chaulmoogra oil of considerable degree, although less than WALKER claimed, while non-acid-fast bacilli were not inhibited by fifty times the amount of chaulmoogra oil that served to completely inhibit the growth of the tubercle bacillus. On comparing the effects of different oils of the chaulmoogra and allied species that of *Hydnocarpus wightiana* gave the greatest inhibitory power, *Taraktogenus kurzii* and *H. alcalae* came next, while *Gynocardia odorata* had no effect, not containing any of the chaulmoogric fatty acid series. Further, a sodium salt prepared from isolated hydnocarpic acid approaches in strength a soap of the total fatty acids, while the sodium salt of chaulmoogric acid is far below the soap of hydnocarpic acids in growth-inhibiting effect, as previously found by WALKER.

ii. The inhibitory effect of a large number of oils on the growth of tubercle bacilli on solid media is here dealt with, in a similar manner to the tests of chaulmoogra oils in the preceding paper, in concentrations not exceeding 0·5 per cent. of the culture medium. No less than forty-two oils, including vegetable, essential and animal oils, mostly found in the tropics, were investigated, and the results are arranged in a table to indicate the amount of oil added to 10 cc. of agar which produced inhibition of the culture. Three groups stand out, firstly the oils which inhibit acid-fast bacteria in comparatively small doses, with or without acting on non-acid-fast bacteria. The figures given as growth-inhibiting value express the relative strength of the inhibitory effect, 1 per cent. concentration being taken as a unit.

Of the chaulmoogra group *Hydnocarpus wightiana* showed the highest effect with a value of 100, 0·001 being the titre, against a value of 20 and a titre of 0·005 of *Taraktogenus kurzii* and *H. venenata, subfalcata* and *alcalae*. Of other oils *Cinnamomum zeylanicum* showed the remarkable result of being equal to *H. wightiana* against acid-fast bacilli and also against non-acid-fast bacteria, while the next highest effect against acid-fast bacilli only was shown by cashew nut oil [which was used externally in leprosy in South America several decades ago], namely a value of 10 and titre of 0·01, and the same results were got with vitiveria (*Andropogon zezanioides*), dacrydium and bergamot oils. Thus, although only the chaulmoogra group show high values against acid-fast bacilli, several other oils have an appreciable action on them.

L. R.

READ (B. E.). **A Chemical Study of the Comparative Values of the Ethyl Esters of Chaulmoogra and Hydnocarpus Oils.**—*China Med. Jl.* 1924. Jan. Vol. 38. No. 1. pp. 25–34. With 1 fig. [7 refs.]

This paper also deals with the comparative value of chaulmoogra and hydnocarpus oils investigated at the Peking Union Medical College. After a brief account of the advances of the last few years, it is pointed out that the Chinese variety of chaulmoogra oil is derived from *Hydnocarpus anthelminthica*, or Ta Feng Tzu, which is said to have been imported from Siam as early as 1590, is cheap and plentiful all over China, and can be supplied by Dr. McKEAN, of Chien Mai, Siam, in large quantities. It is essential to obtain unadulterated oils, and that obtained by cold expression, which remains liquid at ordinary temperatures, is better than hot drawn oil. Chinese samples are often adulterated to the extent of 50 per cent., probably with soy bean oil. Taraktogenus and Hydnocarpus oils are regarded as of equal value, and also that of *H. anthelminthica*, known as lukrabo oil, 120 lb. of the seeds of which yielded 33·15 lb. of kernels, from which 7·4 lb. of oil was got by moderate pressure, the cost of the oil without labour coming to from 1 to 1·5 dollars. DEAN's method of preparing ethyl esters is next described, 10 lb. of the expressed oil yielding 4 litres of ethyl esters, which is about 17 per cent. more than is obtained from chaulmoogra oil. The molecular structure of the acids is next discussed, POWER's early work being quoted, and it is concluded that a low iodine value, other factors being good, indicates a greater percentage of chaulmoogric acid and activity. Pure ethyl esters give little or no pain on injection, the hydnocarpus esters being entirely painless. The suggestion is made that one part of the soap of chaulmoogric fatty acids incorporated in 5 to 10 parts of ordinary toilet soap would make a satisfactory toilet soap for the use of lepers, and that the ethyl esters prepared from *H. anthelminthica* are superior to those of chaulmoogra oil, while the low price of this common Chinese oil should make it of service to the medical profession in China.

L. R.

PERKINS (Granville A.) & CRUZ (Aurelio O.). **A Comparative Analytical Study of Various Oils in the Chaulmoogra Group.**—*Philippine Jl. Sci.* 1923. Dec. Vol. 23. No. 6. pp. 543–571. With 1 plate. [9 refs.]

This is an important but highly technical contribution to our knowledge of the composition of chaulmoogra, hydnocarpus and other closely allied oils, bringing out some practical points, and based on work in the chemical laboratory of the Culion Leper Colony. Both commercial samples of the oils and, where possible, the actual seeds from which the oils are extracted were obtained, including those of true chaulmoogra oil of the British Pharmacopoeia. *Taraktogenus kurzii*, seven varieties of Hydnocarpus, the most important of which are the Indian *Hydnocarpus wightiana* and the Chinese *H. anthelminthica*, which are very closely allied both botanically and in their chemical composition to true chaulmoogra oil, together with the oils of *Pangium edule*, which was incorrectly said by BRILL to contain the chaulmoogra series of fatty acids, were examined, and lastly *Gynocardia odorata*, which was confused for long with true chaulmoogra oil, although it also does not contain that series of fatty acids, these last two therefore being unlikely to be of much value in leprosy treatment. Three of the other Hydnocarpus varieties are found in small limited areas of the Philippines and are not available in commercial quantities. A table is first given of the previously recorded chemical data on this subject; a brief description of the trees furnishing the oils follows, with the methods of extracting the oils, and the amounts obtained from the various seeds are tabulated, which in the case of the first grade oils from well preserved seeds varied from 8 to 38 per cent., but was much lower, 2 to 19 per cent., in second grade oils of a very dark colour from seeds which had not been properly dried and had consequently become rancid; a change which is especially common in that of *Taraktogenus kurzii*, while on the contrary the kernels of the seeds of *Hydnocarpus wightiana* retain a fresh odour, taste, and appearance for many months if kept fairly dry. [The latter are therefore likely to be of especial value orally in the nut form, without extracting the oil, as recently advocated in the case of *Taraktogenus kurzii* by E. A. O. TRAVERS in the Kuala Lumpur Leper Asylum (see above), and the seed can be obtained at a very low rate, about three shillings for 80 lb., from the Ernakalum Trading Co., Cochin, S. India.] Mouldy seeds, however, have a very low yield of oil. Optical rotation is the most characteristic property of the chaulmoogra group (including Hydnocarpus varieties), being as high as 45° to 50° against 2·8° to 16·9° in *Pangium edule* and nil in *Gynocardia odorata*. *Hydnocarpus* varieties, especially *wightiana*, give higher readings than Taraktogenus, so are probably slightly superior for medicinal use, although this can only be decided clinically. The iodine value, acidity, and freezing point of the fatty acids vary only slightly in the different oils, while determinations of the specific rotatory powers of the fatty acids indicated that the variations of optical rotation in the different oils is really due to differences in the composition of the fatty acid fraction, and not to any other constituent.

Fraction of the ethyl esters of several oils, to effect a partial separation of the mixed fatty acids, is next described and the properties of the higher and lower melting point acids are tabulated and their characters described. Very little difference was noticed between those of *Taraktogenus kurzii* and of *Hydnocarpus wightiana*, the two most commonly used oils in treatment, but the hydnocarpic acid fraction was definitely lower in the Chinese variety, *H. anthelminthica*, whose specific rotatory power is also low. The only hydnocarpus oil which differed much from the rest was *H. alcalae*, which contains a very large amount of chaulmoogric and little or no hydnocarpic acid, so is likely to be inferior in treatment, while the conclusion is come to that there is no reason for regarding Hydnocarpus oils in general as inferior therapeutically to true Chaulmoogra oil. The latter is more expensive and difficult to get and also more liable to deteriorate than that of *Hydnocarpus wightiana*.

L. R.

STEVENEL. **Note préliminaire sur la découverte d'un principe actif dans l'huile de Chaulmoogra.**—*Bull. Soc. Path. Exot.* 1924. Jan. 9. Vol. 17. No. 1. p. 108.

In a preliminary note the writer claims to have discovered the active principle of chaulmoogra oil in the form of an unstable alkaloid, which kills lizards with symptoms like those of curare, but is less toxic to warm blooded animals such as rats. He thinks it may be the cause of giddiness after taking the oil, and that the principle is combined with the fatty acids.

L. R.

SAMSON (José G.) & LIMKAKO (Gabino). **Preliminary Report on Creosote as an Adjuvant in Leprosy Treatment.**—*Philippine Jl. Sci.* 1923. Nov. Vol. 23. No. 5. pp. 515–527. With 2 text figs. [1 ref.]

MUIR uses creosote in combination with ethyl ester hydnocarpate in leprosy as an antiseptic, while its value in tuberculosis makes it possible that creosote may also have some direct action in leprosy. The writers have carried out careful tests to ascertain if this addition has such direct value, 194 patients being divided into four closely similar groups and given the following treatment:—

Group I.—53 cases, ethyl ester chaulmoograte intramuscularly.

Group II.—49 cases, ethyl ester chaulmoograte intramuscularly and creosote orally.

Group III.—43 cases, ethyl ester chaulmoograte intramuscularly, creosote and camphor (Muir's E.C.C.O. mixture).

Group IV.—49 cases, ethyl ester chaulmoograte intramuscularly and creosote, but no camphor.

Group II received 0·3 gram. of creosote in pill at each injection of E.E. chaulmoograte, the injections in all the groups being given twice a week. Group III had injections of a mixture of E.E. chaulmoograte 100 cc., creosote 25 cc., and camphor 25 grams. In group IV no camphor was used, but 12·5 cc. of creosote to 100 cc. of the ethyl esters were injected. The dose was increased by 1 cc. at a time up to the amount which could be tolerated without untoward local or general effects, and the relative amount of irritation to the tissues produced is shown by the fact that the average dose of the first two groups with the injection of ethyl esters alone was 3·8 and 3·7 cc., and of the last two groups only 3·1 and 3·2 cc. It was found that the addition of camphor lessened the irritant effect of the creosote, as while in Group III 20 per cent. of each could be used, in Group IV 20 per cent. of creosote alone was too irritating to be borne and the amount had to be reduced to approximately 11 per cent. The percentage of reactions was 4·3 and 5·9 per cent. in groups I and II, and 6·6 and 8·4 per cent. in groups III and IV, while the percentage of cases reacting were 54·7, 63·1, 76·7 and 73·5 respectively in the four groups, the reactions also having been more severe in the last two groups, which accounts for the smaller average doses tolerated by them, while in the first few creosote injections slight fever was noted, but not with later ones. On the other hand, the reactions produced by the creosoted preparations were milder than with the plain preparations, while they produced practically no exacerbations of the old lesions.

At the end of six months the results obtained were carefully worked out and classed as improved, stationary or worse, and showed distinctly greater (61 per cent.) improvement in the creosoted than in the plain preparations (51 per cent.). Group I showed only 43 per cent. improved and 8 per cent. worse, group II gave 59 per cent. improved and only 2 per cent. worse, Group III 58 per cent. improved but 14 per cent. worse, and group IV 71 per cent. improved and only 4 per cent. worse. The creosote groups gave the best results, while the addition of camphor appeared to do some harm, with the largest proportion of cases worse. Creosote was also found to stimulate the appetite, with increase in weight as well as in the improvement rate.

L. R.

RODRIGUEZ (José) & EUBANAS (Froilan). **Treatment of Leprosy with Antimony.**—*Philippine Jl. Sci.* 1923. Dec. Vol. 23. No. 6. pp. 575–594. [11 refs.], and *Monthly Bull. Philippine Health Service.* 1923. Mar. Vol. 3. No. 3. pp. 104–106. [5 refs.]

At the request of Dr. CAWSTON the writers have tried antimony in leprosy cases, as it had been reported by him to have given remarkable results in rapidly relieving paralysis, drying up ulcers and producing general improvement. Thirty advanced hospital cases were treated for six months with tartar emetic intravenously and twenty-two received antimony wine orally, and another twelve a modified Castellani yaws mixture for three months, the average duration of the disease being eleven years. Only an average of 0·0015 gram of tartar emetic a week intravenously or 0·252 gram. of vinum antimonale was borne, and no improvement was noticed in any group, the general condition on the whole being unfavourably affected, while six of the intravenous group and one other case died. In 25 per cent. of the survivors the ulcers improved as well as in 42 per cent. on the Castellani mixture, mostly in ulcers of nodules of short duration. In the intravenous group an outstanding feature was injury to the kidneys, and in the other group lepra fever. The low tolerance to the intravenous method in lepers is striking as compared with such diseases as kala azar, and is attributed to the great strain on the kidneys in advanced lepers with extensive skin disease and loss of sweating power. Some cases with complicating pulmonary tuberculosis appeared to be injuriously affected by the antimony treatment. They were, thus, quite unable to confirm the good results claimed by CAWSTON and supported by WILDISH, and although they were not able to try the proprietary preparation oscol stibium, they see no reason to think it is likely to prove more effective.

L. R.

MACKAY (James G.). **The Antimony and Sulphur Treatment in Leprosy.** [Correspondence.]—*S. African Med. Rec.* 1924. Apr. 12. Vol. 22. No. 7. p. 159.

Although the writer has "everything to say in favour of the ethyl esters of chaulmoogra oil," he thinks there is sufficient evidence to warrant the further and more wholesale use of antimony with sulphur as introduced by CAWSTON, so that this South African expert may be helped, and all the glory of the improved treatment not left to India. He records no personal experience of the method.

L. R.

HERXHEIMER (Gotthold). **Ueber die Leprazellen.**—*Virchows Arch. f. Path. Anat. u. Physiol.* 1923. Vol. 245. pp. 403–447. With 6 figs.

This is a very lengthy description of the anatomical and microscopical changes found in a case of nodular leprosy, with numerous references to the older literature. Naked-eye lesions were found only in the skin and naso-pharyngeal mucous membrane, not in the internal organs, where microscopically a few acid-fast bacilli were detected in the liver, spleen, and in the glands. Sections of the skin showed unchanged epithelial cells, and no excess of pigment. The cutis showed extensive leprotic infiltration with typical large cells containing numerous bacilli, and staining with scarlet-red solution shows up clearly the lepra cells and demonstrates the characteristic lipoid material in them, as is illustrated by coloured drawings. Endothelial cells of small capillaries showed many separate bacilli, while in the large vacuolated cells masses of bacilli were found at the edges of the vacuoles; some of the organisms have degenerated and broken up into small red granules. The vacuolated cells with degenerated bacilli are not found in the internal organs. The bacilli can therefore more or less exist in all the cells of all parts of the body and increase undisturbed and with very little damage to the cells, but in these they are never found in large globular masses, but always as scattered well-developed rods of a saphrophytic nature in vessel or gland endothelium, which may be swollen, but are otherwise unaltered, and never show the vacuolation which is so typical of the large lepra cells of the skin lesions. These are derived from the reticulo-endothelial cells of the cutis, which alone show degenerative changes with vacuolation and massed bacilli, some undergoing degeneration. Thus these cells disintegrate the bacilli, but are themselves destroyed in the process with the formation of lipoid substance, whether derived from the capsules of the bacilli or not being doubtful.

References are next made to recent literature on the action of chaulmoogra oil and its derivatives, and the suggestion is made that previous treatment with this oil may account for the lipoid material found in the lepra cells. Lastly, the literature of animal experiments is dealt with, and stress is laid on the value of the findings of KYRLE in monkeys inoculated with masses of lepra bacilli in nodules, in some of which the tissues excised and examined showed vacuolated lepra cells containing masses of bacilli, some undergoing disintegration, as in skin lesions of human leprosy, indicating positive results of the experiment.

L. R.

LIMOUSIN (Henri). **Inoculation de la lèpre au lapin.**—*C.R. Acad. Sci.* 1924. Feb. 4. Vol. 178. No. 6. pp. 599–600.

A rabbit was inoculated with human lepra bacilli (from the nose of a leper) into the anterior chamber of the eye, with only temporary local reaction, but when killed after 22 months several nodules containing acid-fast bacilli were found in the lungs only.

L. R.

MAZZA (Salvador). **Phagocytose des bacilles de Stefansky dans le péritoine des rats et des cobayes.**—*Bull. Soc. Path. Exot.* 1924. Mar. 12. Vol. 17. No. 3. pp. 208–211. [3 refs.]

METCHNIKOFF showed that Koch's tubercle bacillus in animals is first phagocyted by polynuclear leucocytes, which in their turn become included in mononuclears uniting to form giant cells as shown by BORREL. The writer has found the same procedure to follow the intraperitoneal injection of Stefansky's rat-leprosy bacillus in animals within about eight hours, during which the polynuclears show degenerative processes.

L. R.

i. MORISSEAU. **Le dépistage de la lèpre au début.**—*Rev. Méd. et Hyg. Trop.* 1924. Jan. Vol. 16. No. 1. pp. 24–26.

ii. DOUGLAS (A. R. J.). **Control of Leprosy.** [Correspondence.]—*Brit. Med. Jl.* 1924. Mar. 8. p. 446.

iii. PRINGAULT (E.) & VIGNE (P.). **Les traitements recents de la lèpre.**—*Congrès de la Santé Publique et de la Prévoyance Sociale, Marseille, 11–17 Septembre,* 1922. *Comptes Rendus.* pp. 130–136. [26 refs.]

iv. HAMZAH (Moehamad). **The Results of treating Leprosy with Thymol.**—*Trans. Roy. Soc. Trop. Med. & Hyg.,* 1923, Dec. 13. & 1924, Jan. 17. Vol. 17. Nos. 6 & 7. pp. 386–391.

i. The Negroes of the Upper Volta region, West Africa, who readily recognize the early signs of leprosy, look for discoloured patches on the body, pains on pressure over the distal phalanges, and a nodule in the testicle, and in choosing captives they avoid any showing these signs.

ii. A letter from Burma advocating segregation as of more importance than treatment in the control of leprosy. [It is not explained how the 100,000 census-returned Indian lepers, or the million believed by MUIR to be the true number, can be segregated, with the financial and administrative resources available.]

iii. This is a brief review of some of the recent literature regarding the treatment of leprosy, with a number of references, but no new material.

iv. This paper refers to the same work as a communication by the same author previously dealt with in this *Bulletin.* [Vol. 21, p. 182.]

L. R.

REVIEW OF PELLAGRA LITERATURE.

With the passing of war conditions the occurrence of pellagra epidemics has apparently ceased. Having regard to the commonly accepted view as to the etiology of the disease this is not unexpected; indeed, it may be regarded almost as a further proof of the food deficiency theory. Nevertheless, the impetus given to pellagra research during the war is still manifest from the number of isolated cases described, especially in places where formerly the disease was rare, or altogether unknown.

A number of cases have been described in the British Isles. HUTCHINSON & PATERSON[1] report the disease as it occurred in two children. Both were little girls who had lived all their lives in England and in neither could any definite history of food-deficiency be traced. For some time prior to the first manifestations of the disease in both cases large amounts of cornflour had been consumed, but in one, at any rate, the protein was of sufficient amount and of high biological value. No mention of treatment is made, but one of the cases ended fatally, necropsy not being permitted.

Following this paper BIGLAND[2] reviewed the whole question of pellagra in the British Isles, and at the same time described another new case in Liverpool. The patient, a man aged 59, showed comparatively slight clinical signs, but the history was interesting. He lived alone in rooms, and having to prepare the meals himself he admitted that he frequently went without any food at all. This, together with the fact that the man was out of work and mentally confused, made it certain that his diet had been generally insufficient for some considerable time. The gastric juice contained no free HCl and the spinal fluid gave a luetic zone curve with the colloid gold test, though there was no other evidence of venereal infection. The author records other cases having similar spinal fluid changes, and the suggestion is made that a luetic zone curve in the absence of syphilis and disseminated sclerosis may be of diagnostic value.

It would appear that in certain British Asylums pellagra has become definitely endemic and in such every year a number of fresh cases are reported. WATSON[3] describes the outbreaks in the Lancashire County Mental Hospital, Rainhill. During the years 1913–1918 inclusive 36 definite cases were noted, though there were several others of " central neuritis " with all the features of pellagra excepting the rash. In 1919–1920 no further cases were reported and the survivors of previous years showed no recurrences. In 1921 there was only one case, but in 1922 a severe outbreak occurred, fourteen new cases being recorded. The majority of these had been in the Institution for a considerable time, and therefore the adequacy of the diet was carefully investigated. It was found that in 1922, the year of the severe outbreak, the diet was more generous and more varied than it had been in any previous year, even before the war. The reason for this outbreak remains, therefore, a mystery. In eight of the twelve fatal cases autopsies were made and the brain investigated with the greatest care. The most characteristic lesion found was a central neuritis without inflammatory reaction.

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[1] HUTCHINSON (Robert) & PATERSON (Donald). Pellagra in Children in England. —*Brit. Med. Jl.* 1923. Oct. 13. pp. 646–647. With 3 figs. [2 refs.]

[2] BIGLAND (A. Douglas). Pellagra in the British Islands.—*Lancet.* 1923. Dec. 15. pp. 1295–1296. [28 refs.]

[3] WATSON (G. A.). Pellagra.—*Ninth Annual Report of the Board of Control, for the Year* 1922. *Lunacy & Mental Deficiency.* pp. 74–76.

From Germany come reports of three cases, two in Berlin and one in Breslau. In the case described by **BUSCHKE** & **LANGER**[4] the patient, a woman aged 41, had lived for a considerable time prior to the commencement of the disease upon powdered maize given to her by a friend in a chocolate factory. She became inordinately fond of this and for the last few months she had eaten practically nothing else. The case ended fatally but the autopsy revealed nothing very abnormal.

GRUNENBERG[5] describes a case in a man, 45 years of age, in which the probable cause of the disease was a food deficiency due to achylia and progressive loss of appetite consequent upon chronic alcoholism and severe rectal haemorrhages. The patient was treated with picric acid solution (1 per cent.) given in doses of 1·5 cc. daily. The daily dose was taken in single drops spread over a period of three to six hours. No mention is made of recovery or otherwise.

FISCHER[6] prefers to call his case, occurring in a young servant girl in Breslau, "pellagroid," though the appearances described are fairly typical. Apparently the presence of advanced phthisis and recent syphilis complicated the issue. The patient had recently received 28 intravenous injections of salvarsan and the author mentions the possibility of arsenic poisoning, though he states that this is very improbable.

According to **TYAU**[7] pellagra up to the present had not been described as one of the diseases of China. Before March, 1923, no cases had been seen in Shanghai. Since then six cases, three of them fatal, have occurred. All were males over forty years of age belonging to the poor, working class. The author considers these six cases in detail. Unfortunately the photographs accompanying the article are so badly reproduced that it is difficult to discern the skin lesions, though there is no doubt that the disease is true pellagra. Rice was the staple food consumed by these pellagrins, and one would expect that if rice were a possible factor in the etiology the disease would be commoner than apparently it is. The author evidently realizes this, for he sounds a warning note to the medical men in China to be on their guard against the disease.

Another Chinese case is reported by **WU**[8], occurring in Wuhu. In this instance, the man, a poor boatman, lived only on rice and vegetables; occasionally he had fish but very rarely did he eat fresh meat.

In previous reviews the records of especially conducted researches upon etiology had a prominent place. At the present time such work appears to have come to a standstill. With the exception of the brief references to the possible causation of the particular cases already described only two noteworthy papers have appeared. **Goldberger, Waring** and **Tanner**[9] present a continuation of their previous experiments, which are now classical. The observations were made at three orphanages and also in a section of the Georgia State Sanitarium. Each of these institutions is an endemic focus of the disease. " The institution diet was in each instance modified by reducing the maize element and increasing the fresh animal protein foods—meat, milk (and, at the orphanages, eggs) and legumes." All other conditions remained unchanged. In all 702 individuals were kept under observation ; of these 414 were pellagrins and 288 controls. " Among the pellagrins a single recurrent case was noted during the first year following the inauguration of the modified diet ; none in the second nor in the third year. Among the non-pellagrins there was not a single case. At one of the institutions a return to the old diet was made, with the result that in a short time the pellagra incidence was about 40 per cent. among the affected group. Resumption of the modified diet over a further fourteen months brought about a complete disappearance of the disease. It will be admitted that there is justification for the authors' contention that " pellagra may be completely prevented by diet."

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[4] BUSCHKE (A.) & LANGER (Erich). Sporadisches Auftreten von Pellagra in Berlin.—*Klin. Woch.* 1923. Oct. 15. Vol. 2. No. 42. pp. 1921–1925. With 2 text figs.

[5] GRUNENBERG (Karl). Ueber einen Fall von Pellagra.—*Med. Klin.* 1923. Oct. 14. Vol. 19. No. 41. pp. 1365–1367. [9 refs.]

[6] FISCHER (Martin). Ein Fall von Pellagroid.—*Med. Klin.* 1923. Dec. 9. Vol. 19. No. 49. pp. 1606–1607.

[7] TYAU (E. S.). Pellagra in Shanghai.—*Nat. Med. Jl. China.* 1923. Dec. Vol. 9. No. 4. pp. 272–279. With 5 text figs.

[8] WU (S. C.). A Case of Pellagra in Wuhu.—*Nat. Med. Jl. China.* 1923. Dec. Vol. 9. No. 4. pp. 280–283. With 1 text fig.

In another paper **Goldberger** & **Tanner**[10] have continued their experiments in pellagra prevention with respect of substances other than meat. The effect of milk was studied in a sanitarium upon 29 coloured females, 19 of whom were pellagrins and 10 controls. In addition to the ordinary diet a daily ration of 40 fluid ounces of buttermilk was ordered. " None of the group of 29 patients developed any evidence of pellagra at any time during the observation period which, for 16 of the pellagrins and 9 of the non-pellagrins, lasted one year." Apparently ordinary milk is just as potent both for prevention and cure. Failure to prevent pellagra was noted when butter or codliver oil were tested in this respect. The amount of the former used in the experiment was a daily ration of 125–135 grams and of the latter 2 grams per kilo of body weight.

The infection theory enthusiasts have little to report. **Page**[11] claims to have isolated an organism from pellagra stools. The following characteristics are described :—" A gram positive, sporulating, actively motile bacillus ; aerobic and slightly faculative anaerobic ; non gas producing ; grows at 37° C. and at room temperature ; pellicle formation on bouillon ; liquifies gelatin ; digests Loeffler's blood serum. Does not ferment dextrose, lactose, saccharose or maltose ; peptonsesi milk ; conforms somewhat to those of organisms of the subtilis mesentericus group." The bacillus was isolated from the stools of 24 pellagrins and was not found in 10 control cases. The serum from pellagrins will not, as a rule, agglutinate the bacillus but the fluid obtained from blisters apparently possesses this power.

It is remarkable that those who lean to the microbic theory of pellagra do not pay more attention to the achlorhydria present in a large number of the cases. When it is remembered that achlorhydria may be present for a considerable time prior to the onset of such conditions as pernicious anaemia and subacute combined sclerosis of the cord, and when the sore tongue in the former condition and the combined cord lesions in the latter are taken into account the possible causal connexion is, at least, suggestive. Perhaps the matter is worthy of further research.

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[9] **Goldberger** (Joseph), **Waring** (C. H.) & **Tanner** (W. F.). Pellagra Prevention by Diet among Institutional Inmates.—*Pub. Health Rep.* 1923. Oct. 12. Vol. 38. No. 41. pp. 2361–2368. [13 refs.]

[10] **Goldberger** (Joseph) & **Tanner** (W. F.). A Study of the Treatment and Prevention of Pellagra. Experiments showing the Value of Fresh Meat and of Milk, the Therapeutic Failure of Gelatin, and the Preventive Failure of Butter and of Cod-Liver Oil.—*Pub. Health Rep.* 1924. Jan. 18. Vol. 39. No. 3. pp. 87–107. [19 refs.]

The question of pellagra treatment at present is intimately connected with diet. GOLDBERGER & TANNER[10] selected eight moderately severe cases of the disease to which they gave a daily addition to their diet of 200 grams of lean steak. In all the cases clinical improvement followed. In four of the cases gelatin had been tried previously without result, an interesting observation which tends to support the view that certain amino-acid groupings are essential in the prevention of the disease. Buttermilk (48 ozs. per diem) gave fairly good results, but it was not as potent as meat.

PAGE[11] reports good results from the oral administration of Ichthyol gr. 5 or Copper arsenite gr. 1/100 three to four times a day.

A. Douglas Bigland.

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[11] PAGE (B. W.). Etiology of Pellagra.—*New Orleans Med. & Surg. Jl.* 1923. Nov. Vol. 76. No. 5. pp. 245–247.

NATIVE DIETARIES.

ADOLPH (William H.). **Diet Studies in Shantung.**—*China Med. Jl.* 1923. Dec. Vol. 37. No. 12. pp. 1013–1019. [4 refs.]

The author commences his work with the statement that "South China fed itself monotonously on rice and North China substituted wheat for rice and consumed it in the same monotonous way." In order to get more detailed information trained students were instructed during a summer vacation to keep accurate records of their own family's diet. In this way a dietary of twenty middle class Shantung homes was obtained. The individuals in these twenty families numbered 146 adults and 76 children. The figures recorded may be regarded as typical for the wheat districts of North China.

The investigation showed that "wheat and wheat-products far outbalanced the other food materials, and millet, beans and Kaoliang are also of considerable importance. Rice and meat do not figure in large amounts, and milk not at all."

The per capita fuel value of the diet amounts to 3,355 calories, of which 87 per cent. is derived from cereals. The average body weight of the Shantungese is about 60 kgm. and the work of the subjects of this study may be graded as "moderate muscular work." The Western allowance would be 3,500 calories. The food consumed is, therefore, just about sufficient to supply the needs of these families, but nothing more.

Of the 111 gm. of protein consumed per capita only 5·3 gm. are animal protein. This figure is to be contrasted with the Western diet in which about 50 per cent. of the protein is of animal origin. It must not be forgotten, too, that the figure 111 gm. represents only the protein consumed, and allowing for the poor digestibility of vegetarian diet the actual amount assimilated and metabolized must be considerably lower.

Another somewhat remarkable fact is that only 11 per cent. of the protein was derived from beans, and the author points out that in North China the diet could advantageously contain more Soy bean and less wheat.

A. Douglas Bigland.

ROXAS (Manuel L.) & COLLADO (Esteban G.). [In English and Spanish.] **A Preliminary Critical Study of the Filipino Diet. I. Estudio critico preliminar acerca de la alimentacion de los Filipinos. I.**—*Jl. Philippine Islands Med. Assoc.* 1922. July-Aug. Vol. 2. No. 4. In English pp. 171–185; In Spanish 197–211. [15 refs.]

Apparently the average Filipino diet is deficient. This is evidenced by the frequency of beriberi and the very high infant mortality rate. Investigations were carried out to discover the particular respects in which the diet of Los Banos families was deficient. The results show that protein is consumed in insufficient amounts, that vitamin carriers (vegetables and eggs) constitute only 4·1 per cent. of the diet and that there is a deficiency of calcium.

Rice forms 85 per cent. of the diet of the common people and, as McCollum has shown, this is deficient in four respects.—(1) Poor quality and quantity of its proteins, (2) Poor quality of its mineral salts, (3) The absence of vitamin A, (4) The absence of vitamin B.* To these defects the author adds another, viz., that rice is lacking in vitamin C.

For the correction of the protein, vitamin and calcium deficiency of the Filipino diet the liberal use of vegetables and milk is urged. In the fostering of dairy farming and vegetable growing lies the true solution of the problem.

A. D. B.

Das (Jahar Lal). **Some Observations on the Dietary of Scholars.**—*Indian Med. Gaz.* 1923. Sept. Vol. 58. No. 9. pp. 424–427.

The diet in the hostels attached to the High Schools of Bihar and Orissa was made the subject of careful study. Investigations proved that the diet was deficient in proteins, fats and vitamins though the carbohydrate and caloric values were fairly satisfactory. The essentials of the diet were dal (pulses) and bhat (boiled rice). The defects were apparently pointed out to the authorities and tables were drawn up showing how the diet could be rendered efficient with due regard to the cost of the food.

Unfortunately there is no record of the bad effect, if any, of the deficient diet upon the health of the scholars.

A. D. B.

Barrowcliff (M.). **The Vitamins.**—*Fifth Congress Far Eastern Association of Tropical Medicine. Singapore, September, 1923.* 7 pp. 1923. Kuala Lumpur: Printed at St. John's Press.

A brief résumé of the history of vitamins is given, and towards the end of his remarks the author makes the following statement:—

> The diet that produces beriberi in the few can hardly fail to have a deep-seated and bad physiological effect on the many, and ocular evidence in native settlements of probable malnutrition in the form of affection of the eyes and skin is rarely far to seek. In consideration of this and recollecting the extent to which the European in the tropics has often to subsist upon canned foods and milk, with relative absence of salads and green stuffs, it seems not unlikely that some at least of the evils ascribed to the climate may be due really to the food.

A. D. B.

Findlay (George Marshall). **A Preliminary Note on the Destruction of Vitamin B by Age.**—*Biochemical Jl.* 1923. Vol. 17. No. 6. pp. 887–890. With 5 charts. [3 refs.]

Samples of Indian lentils and peas kept for thirty-eight years were investigated for the presence of vitamin B. It was found that a small amount of the vitamin had been lost but appreciable quantities still remained. The seeds had lost the power of germination. These results are of interest as regards the survival of vitamin B for a very long period of time.

A. D. B.

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* This must refer to polished rice.

McCarrison (Robert). **Pathogenesis of Deficiency Disease. XIV. On the Occurrence of Ophthalmia in Pigeons fed exclusively on Parboiled Rice and on its Prevention by the Addition of Soil to the Food.**—*Indian Jt. Med. Res.* 1923. Oct. Vol. 11. No. 2. pp. 323–335. With 3 charts.

Parboiled rice from the Kistna District of the Madras Presidency was found to cause polyneuritis columbarum only in exceptional cases. Autoclaving the rice and thus destroying the vitamin B was responsible for the development of polyneuritis. Though the parboiled rice could prevent polyneuritis it could not prevent ophthalmia. From these findings it would appear that in those districts where the rice is parboiled ophthalmia should be more common than beriberi, while the converse should be found where the rice was not parboiled before milling. This assumption is supported by the following facts :—

> "In the Tanjore District of the Madras Presidency, where the almost universal practice is to use parboiled rice, beriberi is practically unknown, whereas the hospital reports show the number of cases attending for eye disease during the year 1920 to be 118 per million. In the Kistna District, where raw milled rice is in almost universal use, beri-beri is common, eye diseases less so; the number of cases attending hospital for the former during the year 1920 being 153 per million, for the latter 55 per million."

The author found that garden soil, freed from rootlets as far as possible, contained some substance which gave protection against the ophthalmia caused by eating parboiled rice. This substance is probably vitamin A but possibly some unknown allied body.

A. D. B.

HELMINTHIASIS.

BRUMPT (Émile). **La migration des helminthes. Leur importance dans la pathogénie du cancer. Rôle des animaux domestiques et sauvages dans la prophylaxie des maladies parasitaires.**—Conference faite à la Société de Médecine et Chirurgie de Rio de Janeiro, le 20 Septembre 1922, et écrite spécialment pour la "*Folha Medica.*" 10 pp. 1922. Rio: Canton & Beyer. Rua Luiz de Camões, 74.

In an address to the Society of Medicine and Surgery of Rio de Janeiro, Professor Brumpt reviewed the part played by helminths, as revealed by recent researches, in inducing disease and the protective rôle assumed by certain of the domesticated and wild animals in the prophylaxis of parasitic maladies. The migrations followed in the normal host may be similarly followed in vicarious hosts, but in the latter case the larvae do not attain to maturity. Auto-infection with *Strongyloides vituli* of cattle produced local oedema, but intestinal infection did not become established. The researches of FIBIGER on the production of neoplasms by *Gongylonema neoplasticum*, and BORREL's studies on the association of malignant growths with the presence of *Cysticercus fasciolaris*, suggest that possibly cancerous growths in man may have had their origin in migrating helminths which died long before the clinical diagnosis had been arrived at. As possible factors in zooprophylaxis of helminths the water-buffaloes in Egypt are quoted as playing an important rôle by attracting innumerable cercariae shed into the water by infested molluscs.

R. T. Leiper.

NICOLL (William). **Remarks on the Pathogenicity of Common Intestinal Worms.**—*Lancet.* 1924. Jan. 26. pp. 174–176. [4 refs.]

A stimulating paper, urging the claims of helminthic infections on the attention of the general practitioner, who hitherto has been inclined to relegate this matter to the domain of tropical medicine. It is not the author's intention to record any new work in the field of helminthology, in which he has already made a name, but to point out that from the medical side enteritis and severe diarrhoea, cutaneous disturbances (probably of toxic origin analogous to serum rashes), atypical febrile attacks, anaemia of varying degree, pneumonic conditions, and, from the surgical aspect, biliary obstruction, appendicitis or a symptom-complex simulating appendicitis, may all arise from worm infections.

He proposes publishing a bibliography containing the more important clinical records in recent years in this connexion.

H. Harold Scott.

SIGALAS (R.) & PIROT (R.). **Un nouveau procédé d'enrichissement en coprologie.**—*C.R. Soc. Biol.* 1924. Mar. 28. Vol. 90. No. 11. pp. 755–757.

Among the chief objections to most methods of examining faeces for helminth ova are that much time is occupied if examination of several direct smears is made, and even then a negative finding is no proof of absence, or that special apparatus or materials are needed which are often difficult to obtain abroad, and that only a small portion of the stool is submitted to examination. The authors here describe a method by which the stool is first broken up by shaking in a 300 cc. flask with 100 cc. of water containing some 30 large glass beads. The resulting mass is then filtered through a metal screen with wide meshes (an ordinary gas-fire screen will do). The filtrate is collected in a large glass and after sedimentation has taken place the deposit is taken up with saturated salt solution (S.G. 1185 or thereabouts), turned into a cylindrical tube, which is then filled to the top, covered with a glass slide and left for 24 hours undisturbed; the ova are then readily seen. [The authors state that their method differs from that of BASS, but they make no mention whatever of Clayton LANE'S work and method, of which this is clearly a crude adaptation.]

H. H. S.

ISBECQUE (G.). **Recherche d'anticorps spécifiques chez les porteurs de Vers intestinaux.**—*C.R. Soc. Biol.* 1924. Mar. 21. Vol. 90. No. 10. pp. 691–692. [1 ref.]

The author submitted to the complement fixation test sera from 25 individuals; of these 8 were harbouring Ascaris, 6 Trichuris, 3 were infected with both, and 8 were uninfected controls. For Ascaris antigen he used *Ascaris equorum* prepared by the method of WEINBERG and PARVU, and carried out the test by using 0·5 cc. antigen and the same volume of the patient's serum, varying the complement dose. Seven of the eight fixed from 2·5 to 7 doses of complement; the eighth, which proved negative, was a child suffering also from tubercular peritonitis. The sera of those infected with both worms fixed from 3 to 12 doses of complement. Fixation in Trichuris cases was found in only three of the six and these in low titre (2–3 doses). Of the controls one fixed a single dose of complement, the remaining seven none at all, so that all the controls may be regarded as negative. [These records are of great interest, seeing that the results obtained by previous workers have been very uncertain and inconstant.]

H. H. S.

LEIDY II (Joseph). **The Hemotoxins of Intestinal Parasites. A Critical Summary with Notes on Some Cases.**—*Jl. Parasit.* 1924. Mar. Vol. 10. No. 3. pp. 147–152. [21 refs.]

Anaemia associated with the presence of intestinal worms cannot be adequately explained by blood-abstraction and is probably the effect of a haemotoxin. The opinions of several investigators are quoted in this regard and the author gives a brief account of three cases of his own. In the first, a girl of 12 years, obstinate corneal ulceration and malnutrition led to the diagnosis of tuberculosis. There was an eosinophilia (14 per cent.) and ascarides were passed as a result of a dose of santonin, after which the symptoms rapidly cleared up. The second was a boy of 9 years, suffering from eczema, occasional epistaxis, and malnutrition; the third was a boy of 5 years, diagnosed as suffering from angioneurotic oedema. Both of these also recovered promptly after expulsion of ascarides. The paper contains no new facts but serves to impress once again the importance of faecal examination of children and adolescents with anaemia and malnutrition.

H. H. S.

JANICKI (Constantin). **Une théorie nouvelle sur la · morphologie générale des Trématodes et des Cestodes.**—*C.R. Soc. Biol.* 1923. Dec. 22. Vol. 89. No. 37. pp. 1340–1341.

The Trematode and Cestode organism comprises two portions, (*a*) the body and (*b*) the caudal segment. This division is especially notable in the *Monogenea* or ectoparasitic Trematodes. In the Digenetic Trematodes the caudal segment is only represented by the transient larva. This is also the case in the Cestodes, where it corresponds to the tail of the cysticercoid, the cyst wall of the cysticercus and the rudimentary caudal appendage of the procercoid of the bothriocephalid worms. The fundamental unity of the trematodes and cestodes is seen only in transitory stages, and has been replaced in the course of phylogenetic development by a different organization acquired secondarily owing to the influence of endoparasitism.

R. T. L.

KACHI (Giheida) & TASHIRO (Suyekichi). [**Contributions to the Experiment on the Inefficient Method of Collection of Parasites' Eggs in Feces.**]—*Aichi Igakkwai Zasshi* (*Jl. Aichi Med. Soc.*). 1923. Nov. Vol. 30. No. 6. [Summarized in *Japan Med. World.* 1924. Feb. 15. Vol. 4. No. 2. p. 37.]

The authors draw attention to the fact that at times helminthic ova may be found by examination of direct smears of the faeces although not seen after centrifugation. They explain this as being due to the eggs floating in an upper layer of the fluid in the tubes. [No mention is made as to the nature of the fluid employed, but seeing that the floatation method is based on the specific gravity of the menstruum their explanation is probably correct.]

H. H. S.

GREENWAY (Daniel). **Un caso extraordinario de asociación parasitaria intestinal.** [An Unusual Case of Multiple Intestinal Parasitism.]—11 pp. With 8 figs. 1923. Buenos Aires: "Las Ciencias." Libreria y Casa Editoria de A. Guidi Buffarini. 845, Junin.

An account is given of a soldier, 21 years of age, whose only complaint was of fatigue and headache. Blood examination showed a reduction of red cells to 3,430,600 per cmm., haemoglobin 55 per cent., and an eosinophilia of 14 per cent. Examination of the faeces revealed the presence of the following: *Necator americanus*, *Ancylostoma duodenale*, *Strongyloides stercoralis*, *Oxyuris vermicularis*, *Trichuris trichiura*, *Hymenolepis nana*, and fly-larvae.

H. H. S.

DAY (H. B.). **Anthelminthic Work in Egypt.**—*Lancet.* 1924. Mar. 1. pp. 435–437. [8 refs.]

This is a further report upon the success of the "annexe" method of treatment of helminthiasis adopted in Egypt. In addition to that at Kasr-el-Aini Hospital, Cairo, there are now five other annexes established in the larger towns. Over 50,000 patients were treated during 1923. To bilharzial cases tartar emetic is administered intravenously, the initial dose being 1 gr., the maximum 2 gr., and the total 22½ gr. in twelve doses during a period of four weeks. Only 2–4 per cent. of patients require more than this. The cause of failure is usually insufficient treatment, the patients ceasing to attend when symptoms are relieved. One instructive case is detailed. To this patient fifteen injections, totalling 28½ gr., were given in ten weeks.

At the end of this time examination of the urine revealed three dead ova; five weeks later three living and twenty-five dead ova; five months after ceasing treatment 200 living ova were counted. This shows that it is necessary to maintain a sufficient concentration of the drug in the circulation for three to four weeks to kill the adult worms.

Emetine in similar doses for the same length of time was given to (1) Young children, or those with veins too small or inconspicuous for intravenous medication; (2) Cases of intestinal schistosomiasis complicated by amoebiasis; (3) Those intolerant of antimony; (4) Those with advanced hepatic or renal disease. At the end of the course living ova might still be seen, but these disappeared subsequently, and further examination five months later revealed none, showing that emetine has a cumulative effect and kills both worms and ova.

Patients suffering from ankylostomiasis are treated with carbon tetrachloride in doses of 3–5 cc. followed two hours later by a purge, or with oil of chenopodium, two gelatin capsules followed 1½ hours later by a third, each containing 0·5 cc. A week later, if ova are still present, the treatment is repeated, the patient during the interval taking iron and arsenic in mixture or pill. As a rule two treatments with carbon tetrachloride or three with oil of chenopodium suffice to expel practically all the worms.

H. H. S.

Goebel (F.). **Die Behandlung der Wurminfektion.** [Treatment of Helminth Infections.]—*Klin. Woch.* 1924. Mar. 11. Vol. 3. No. 11. pp. 453–456. [58 refs.]

On such a comprehensive subject as this space will permit of our mentioning only those drugs which have been recently introduced. For ankylostomiasis, in addition to oil of chenopodium, thymol, and carbon tetrachloride, the author mentions a preparation of Bayer's, *Isotin,* recommended by Jager in doses of 2 gm. of the powder thrice daily after meals for 5 days. For Ascaris, three new preparations are spoken of: (1) *Wermolin* (containing oil of chenopodium and castor oil) in two doses, each of 5–15 gm., given in milk at an interval of 1–2 hours, for children of 3 to 12 years of age, a purgative being given 2 hours after the second dose. (2) *Helminal,* a dried extract of *Digenea simplex,* in tablets, one to three being given thrice daily for 3 successive days. If ova are still present in the stools eight days afterwards the course is repeated. (3) *Santoperonin,* favourably reported upon for all worm infections. The dose for Ascaris is not stated, but tablets of 1·5–3 cgm. are given with meals three times a day for a week for Oxyuris.

In the treatment of Oxyuris infection the ends to be kept in view are the avoidance of re-infection by preventing scratching at night and by careful cleansing of the fingers and the nails; clearing the large intestine of worms; killing off the young in the lowest part of the small intestine [the author believes in the direct development of the worms at this site]. For eradication new preparations mentioned are three from Aluminium subacetate: *Eston* tablets, *Gelonida aluminium subacetate,* and *Oxymore* (made by interaction of benzoic acid and the basic acetate). Also *Cupronat,* a copper albumin compound, and *Bulotan* (p-Oxydiphenyl-methan). Santoperonin has been already spoken of.

For Taenia two new preparations of *Filix mas* are recommended: *Tritol III,* in which the taste of the fern is masked by malt extract, and *Filmaron,* 0·2–1 gm. according to age. In conjunction with 9 parts of castor oil Baehringer produces this last under the name of *Filmaronol.* Other drugs for the treatment of Taenia which receive mention are *Sebirol,* made from the peel of "*Musenna abessynica,*" and *Taeniol,* a combination of the last with thymol and salicylates.

H. H. S.

MHASKAR (K. S.). **A Note on the Reliability of Post-Treatment Diagnoses of Helminth Infections.**—*Indian Jl. Med. Res.* 1924. Jan. Vol. 11. No. 3. pp. 743–747. [1 ref.].

A series of tables indicate that oil of chenopodium has a toxic action upon hookworms and roundworms which causes a suspension of ovulation lasting to the 12th day after treatment. The effect in the case of betanaphthol, thymol, carbon tetrachloride and santonin is more fleeting and does not extend beyond three days.

These observations indicate that the search for ova in the stool may be relied upon for diagnosis if made after the 4th day but only after the 12th day where chenopodium has been used.

R. T. L.

GRANDSOULT (G. A.). **Carbon Tetrachloride and Oil of Chenopodium in Helminthiasis.** [Memoranda.]—*Brit. Med. Jl.* 1924. Feb. 23. p. 319.

The treatment of helminthic infections in the Georgetown Public Hospital, British Guiana, is recorded, the chief parasites being *Ancylostoma duodenale, Strongyloides intestinalis, Ascaris lumbricoides* and *Trichuris trichiura.* 3 oz. of a saturated solution of sodium sulphate are given in the evening and 40–60 minims of carbon tetrachloride the following morning; on the third night after this another 3 oz. of the sodium sulphate solution. About 40 per cent. of cases cease to pass ova. The author states that carbon tetrachloride is more effective when combined with oil of chenopodium than when taken alone, but gives no details as regards the combined method. Of three cases mentioned in more detail only one had both drugs and this patient had previously undergone two months' treatment with the carbon tetrachloride alone.

H. H. S.

CHEINISSE (L.). i. **Les précautions à prendre dans l'emploi de l'huile de chenopodium.**—*Presse Méd.* 1924. Mar. 1. Vol. 32. No. 18. pp. 193–194. [8 refs.]

——. ii. **Le tétrachlorure de carbone comme anthelminthique.**—*Ibid.* Mar. 8. No. 20. pp. 214–215. [14 refs.]

i. Five cases are recorded in which toxic effects followed the taking of oil of chenopodium; four of them terminated fatally, the main symptoms being vomiting, giddiness, deafness, convulsions and coma. One of the five passed a single worm, none of the others passed any, nor were they found at the autopsies. In every instance large doses had been given and the author very rightly lays stress upon three points :—1. To make sure that worms are present, for vermicides and vermifuges are often given either because the parents think that the child is harbouring worms, or because the symptoms complained of are obscure and something has to be done. 2. To avoid excessive dosage. In one of the cases detailed, a child of 5 years was ordered 20 drops three times a day. The dose recommended is one drop for each year of the child's age, two such doses being given in the day with an interval of one or two hours. 3. Since the drug is supposed to act by merely "stupefying" and not killing the worms, it is essential that a purgative be given soon after the second dose, and, if this does not act well, it should be repeated. The fact is pointed out that oil of chenopodium is particularly effective in Ascaris infection, uncertain with Oxyuris, useless for Taenia. For Ancylostoma it is good, but carbon tetrachloride is better.

ii. This paper gives a brief general review of carbon tetrachloride as an anthelminthic, calling attention to the facts that it is more efficacious for male *Necator americanus* than for the female of that species or for *Ancylostoma duodenale*, and that alcoholic subjects show an undue susceptibility to its toxic action. The whole constitutes a short summary of present-day knowledge of the drug but records nothing new.

H. H. S.

LE NOIR & DESCHIENS (R.). **Action anti-parasitaire du carbonate de bismuth à doses massives dans certaines infestations vermineuses ou à protozoaires du tube digestif.**—*Arch. des. Malad. de l'Appareil Digestif et de la Nutrition.* 1923. Nov. Vol. 13. No. 9. 7 pp.

Oral administration of bismuth carbonate in massive doses has been recommended for oxyuriasis by LOEPER. The authors have tested its effect on roundworms and tapeworms of cats, dogs and mice. They conclude, from a somewhat limited range of experiments, that there is a strong antiparasitic action on certain nematodes but that the cestodes, lacking alimentary tract, are uninfluenced by the drug.

R. T. L.

GUERRERO (Luis E.) with the collaboration of SISON (A. B. M.), MAKALINTAL (A.), VILLASEÑOR (P.), ROSAL (I.) & OCAMPO (A.). [In English and Spanish.] **Niyogniyogan** (*Quisqualis indica* **L.**) **as an Anthelminthic. Niyogniyogan,** *Quisqualis indica* **L., como Anthelmintico.**—*Jl. Philippine Islands Med. Assoc.* 1924. Mar. Vol. 4. No. 3. In English, pp. 83–87. In Spanish, pp. 109–111.

Quisqualis indica has for many years been held in high repute among the natives of the Philippines as an anthelminthic. DE LA PAZ made a pharmacological study of the drug but could not prove that it had any such property. The authors, therefore, treated 11 patients, 7 children and 4 adults, infected with Ascaris. The dose for children was one seed for each year of age, and for adults 12–20 seeds, triturated with syrup of acacia and given for two successive evenings, followed by a purgative the next morning.

Six of the children passed Ascarides, but only one of the adults. In all of them ova persisted in the faeces. Further trial is needed to decide whether the drug is of real value.

H. H. S.

CAWSTON (F. G.). **Distribution of Snails serving as Intermediate Hosts of Flukes in South Africa.**—*Parasitology*. 1924. Jan. Vol. 16. No. 1. pp. 67–68.

This brief paper records some of the findings made by the author during his examination of South African molluscs for cercariae. Examples of *Isidora forskali* were obtained from Amanzimtoti, Isipingo, Clairwood, Umhl-a-tazana, Cato Manor, Inchanga station, Umgeni, Tongaat, Nonoti, Umzindusi, at Pietermaritzburg, Lourenço Marques, and Beira. Amphistomes have been found in this mollusc but the author's attempts to rear the adult worms experimentally in animals have failed. The sheep liver-fluke *Fasciola gigantica* develops in *Limnaea natalensis* and *Physopsis africana*. "Schistosome" cercariae have been found by the author occasionally in *Physopsis africana, Isidora tropica, I. forskali, I. globosa, Limnaea natalensis, Planorbis pfeifferi* and *Segmentina planodiscus*; most of these schistosome cercariae are not identical with those of the schistosomes infecting man. Of four styletted cercariae found the author writes, "one of which occurring in the Durban water-cress is suspected of being *Paragonimus westermani*, the lung-fluke of the Far East." [An unsupported and unwarranted statement which the author has made in previous papers.]

R. T. L.

LANE (Clayton). *Gastrodiscus hominis.*—*Ann. Trop. Med. & Parasit.* 1924. Apr. 30. Vol. 18. No. 1. pp. 27–32. [11 refs.]

The author returns once more to the discussion of the validity of *Gastrodiscoides* as a genus distinct from *Gastrodiscus*. He deals with four characters :—1. The large genital cone. 2. The position of the genital orifice. 3. The smoothness of the ventral disc. 4. The localization of the testes. Those who have examined specimens have recorded differently as regards the presence of the genital cone. STEPHENS and Clayton LANE found none, LEIPER and KHALIL regard it as a special feature. This aspect of the question is disposed of in the paper under review in the following somewhat cryptic sentence: "No matter how often a genital depression may be absent, its authenticated presence eliminates it inevitably as a valid generic character." The second point—the relative position of the genital pore to the edge of the ventral disc—is regarded as invalid because the relative position of the margin of this disc itself is not constant and the position of the pore in relation to internal structures, in particular the oesophagus, varies amongst the species of the genus *Gastrodiscus*. The third point is the nature of the surface of the ventral disc. The smoothness or roughness of this is said to be due to muscular contraction and, if this be definitely proved, all will agree with the author that change of shape induced by muscular contraction and relaxation does not constitute a valid foundation on which to differentiate genera. Lastly, the position of the testes. This is stated to vary in appearance according to methods of examination and is thus also a feature not to be relied upon as a generic character.

H. H. S.

MAURY (E.) & PÉLISSIER (R.). **Obstruction du cholédoque par douve du foie.**—*Presse Méd.* 1924. Mar. 8. Vol. 32. No. 20. pp. 213–214. [8 refs.]

A woman, 43 years of age, had suffered for ten years from repeated attacks of what was considered to be biliary colic. These attacks becoming more violent and more frequent after February, 1922, and the patient having lost nearly a stone in weight in the ensuing three months, an operation was undertaken in May for removing the supposed gall-stone. None was found, but the bile duct was seen to be dilated and from it a specimen of *Fasciola hepatica* was removed. All the symptoms disappeared and the weight was rapidly regained. The remainder of this paper consists of a summary of previously recorded cases.

H. H. S.

DUGA. **Un kyste sous-hépatique dû à** *Fasciola hepatica.*—*Ann. de Méd. et de Pharm. Colon.* Paris. 1923. Sept.-Oct.-Nov.-Dec. Vol. 23. No. 3. pp. 358–359.

At the Yaounde Hospital, a native girl 8 years of age had a sub-hepatic cyst the size of an orange. On puncture a serous liquid was found to contain eggs of *Fasciola hepatica.* After operation many adult flukes were evacuated.

R. T. L.

NAKAGAWA (Koan). **The Development of** *Fasciolopsis buski,* **Lankester.** —*Jl. Parasit.* 1922. June. Vol. 8. No. 4. pp. 161–166. With 3 plates. [2 refs.]

The chief facts communicated in this paper have already appeared in *Kitasato Arch. Experim. Med.* (1921) (see this *Bulletin,* Vol. 19, p. 215). There are, however, more complete descriptions of the developmental stages, and three plates give valuable illustrations of these and of the freshwater molluscs *Planorbis coenosus* and *Segmentina largillierti* which have been shown to act as intermediate hosts in nature. Experimental infections were carried out in the dog and pig. Although the Fasciolopsis is not uncommon in pigs in Formosa no cases have been discovered of its occurrence in man in this region. [This, with the absence of *F. buski* from pigs in the Shaohing endemic region on the Chinese mainland, opens up several interesting problems.]

R. T. L.

NAKAGAWA (Koan) & SUZUKI (Sotowo). [**Studies on the Development of** *Fasciolopsis buski.* **II Communication.**]—*Tokyo Ijishinshi* (*Tokyo Med. News*). 1923. June. No. 2334. [Summarized in *Japan. Med. World.* 1923. Dec. 15. Vol. 3. No. 12. p. 276.]

In an earlier communication the pig was thought to be the only animal in which *Fasciolopsis* infection could be experimentally induced and in which the worm reached maturity. Further experiments show that the worm lived for one month in the dog, two months in the rabbit and for ten days in the guineapig.

R. T. L.

LAL (Shiam Manohar). **A Case of** *Fasciolopsis buski* **Infection.**— *Indian Med. Gaz.* 1923. Dec. Vol. 58. No. 12. pp. 586–587.

A brief note records the finding of ova of Fasciolopsis in a Hindu male admitted to Bulandshahr District Hospital complaining of dysenteric symptoms and the recovery of hundreds of adult flukes after treatment with eucalyptus and chloroform.

R. T. L.

SUZUKI (Satowo). **[On the Resistance of the Encysted Cercaria of** *Fasciolopsis buski.*]—*Taiwan Igakkwai Zasshi* (*Jl. of Formosan Med. Soc.*). 1923. Mar. No. 227. [Summarized in *Japan Med. World.* 1924. Jan. 15. Vol. 4. No. 1. p. 15.]

The encysted cercaria of *Fasciolopsis buski* dies in 1½ hours in a 20 per cent. solution and in 3 hours in a 5 per cent. solution of salt. They have a resistance comparatively greater than the egg to outside influences. For preventive measures it would be best to boil all infested vegetables or keep them in salt solution.

R. T. L.

ANDŌ (Ryō). **[Morphologische und biologische Untersuchung ueber die Zerkaria von** *Paragonimus westermani.*]—*Chug. Ij. Shp.* Tokyo. 1921. Vol. 41. pp. 286–297. With 1 fig. [Summarized in *Japan Jl. Med. Sciences.* Tokyo. 1922. Vol. 1. No. 1. pp. 60–61.]

According to the abstract the original article contains 5 chapters:—(1) Deals with the intermediate host, *Melania libertina*; (2) gives an account of the rediae of cercariae in the body of Melania; (3) recounts the animal experiments relating to infection with these cercariae; (4) describes the biology of the cercariae, with special reference to their powers of resistance to outside temperature, to their vitality in water, and to the influence on the cercariae of digestive juices, body fluids and chemicals; (5) embodies the conclusions. These are:—(*a*) Cold and warm blooded animals, which had been infected with cercariae obtained from Melania by feeding, intravenous injection or transference into stomach, all gave negative results, so that a second intermediate host appears essential for the further development of the cercariae. (*b*) The cercariae are very resistant against cold, but only slightly so against heat. (*c*) The cercariae live for a long time in tap water and in pond water. (*d*) The cercariae soon die in artificial digestive juices, soda solutions and bile, thus showing that infection through the digestive tract does not easily take place. (*e*) The cercariae are immediately killed when transferred to 1 per cent. sublimate solution, 1 per cent. carbolic acid solution, 1 per cent. formalin solution and human urine. From these facts prophylactic and defensive measures may be inferred. (6) The cercaria can live for a long time in Rock's solution, Ringer's solution and blood plasma, which shows that they can complete their development only after having passed through the bodies of Melania and fresh water crabs.

R. T. L.

ANDŌ (Ryō). **[Beiträge zur Kenntnis der Lungendistomiasis.]**—*Ni. Byor. Gak. Kz.* Tokyo. 1921. Vol. 11. pp. 450–451. [Summarized in *Japan Jl. Med. Sciences.* Tokyo. 1922. Vol. 1. No. 1. p. 60.]

Investigations on the problem whether any haemolytic substance could be separated from the lung distome always proved negative. An immunity against fresh infection was shown in cases which had been parasitized by adult worms. This immunity, however, was not transmissible to the young.

R. T. L.

ANDŌ (Ryō). [**Ueber die hämolytische Wirkung von** *Paragonimus westermanii.*] [The Haemolytic Action of *P. westermanii.*]—*Chug. Ij. Shp.* Tokyo. 1921. Vol. 41. pp. 708–724. [Summarized in *Japan Jl. Med. Sciences.* Tokyo. 1922. Vol. 1. No. 1. p. 60.]

The writer has shown that the lung fluke itself, the excreta of the animals as well as the tissues involved, *e.g.*, the cyst and the tissues surrounding it, etc., show no haemolytic reaction on the red blood cells of patients suffering from lung flukes, of syphilitics, of healthy people, or of healthy dogs or those suffering from lung flukes.

R. T. L.

ANDŌ (Akira). [**Studies on the Therapeutic Treatment of Pulmonary Distomiasis.**]—*Iji-Shimbun* (*Med. News*). 1923. July. No. 1121. [Summarized in *Japan Med. World.* 1923. Dec. 15. Vol. 3. No. 12. p. 277.]

Administered intravenously in a solution of 1 per cent. to 3 per cent., calcium chloride has proved very efficacious in lessening the recurrences of haemoptysis and in reducing the number of the eggs expelled.

R. T. L.

ICHIMIYA (Ittoku). [**On the Geographical Distribution of Paragonimiasis in Keishyo-Hokudo in Korea.**]—*Okayama Igakkwai Zasshi* (*Jl. Okayama Med. Soc.*). 1923. Dec. No. 407. [Summarized in *Japan Med. World.* 1924. Feb. 15. Vol. 4. No. 2. p. 40.]

Of more than 11,000 persons examined in the Keishyo-Hokudo district of Korea 6·12 per cent. were found to be infected with *Paragonimus westermanii.* The first intermediate host, *Melania,* is common and the inhabitants are said to eat them boiled ; the second hosts, *Eriocheir* and *Astacus,* were seen in the brook running through the villages, and the natives are fond of eating these, either raw or only partly cooked ; hence the infection.

H. H. S.

KOBAYASHI (Harujiro). [**Studien ueber** *Paragonimus westermanii* **in Korea.**]—*Mitt. Med. Hochsch.* Keijo. 1921. Vol. 4. pp. 5–17. [Summarized in *Japan Jl. Med. Sciences.* Tokyo. 1922. Vol. 1. No. 1. p. 60.]

The first intermediate host of *Paragonimus westermanii* is some species of *Melania.* The miracidia of Paragonimus develop in the first host to sporocysts in which the primary rediae are formed, and in these the daughter rediae develop. The encysted larvae in the second host are not set free, but are generally passively transferred into the body of the final host when this intermediate host is eaten raw.

R. T. L.

MIYAIRI (Keinosuke). **Beiträge zur Kenntnis von der Entwickelung des** *Paragonimus westermanni.*—*Mitt. a. d. Med. Fak. d. Kais. Kyushu-Univ.* Fukuoka. Japan. 1922. Vol. 6. No. 2. pp. 313–319. With 4 plates & 1 fig.

The author summarizes his investigations on *Paragonimus westermanii* covering a period of ten years. The first intermediaries are *Melania paucicincta* and *M. extensa.* The eggs hatch in from 17 to 30 days. The optimum temperature is 30° C. The development of the miracidium to the sporocyst redia and the resulting styletted cercariae with knoblike tail are described. Microphotos of the snails, the developmental stages, and the prawn, *Astacus japonicus,* which can act as the second intermediate host, accompany the brief text.

R. T. L.

WAYSON (N. E.). **An Investigation to determine whether Clonorchiasis may be disseminated on the Pacific Slope.**—*Amer. Jl. Trop. Med.* 1923. Nov. Vol. 3. No. 6. pp. 461–473. [22 refs.]

The author reports that *Clonorchis sinensis* occurred in 5 out of 5,775 Japanese and 315 out of 3,701 Chinese wishing to enter San Francisco. There is a high potential danger of the introduction of this infection to the United States. Experiments failed to incriminate the snails native to local waters although these include species of the same group of molluscs known to convey the disease in China. Moreover, carp which might function as a second intermediary also abound. The rivers of the Pacific slope, which are fed by snow-covered Sierras, have rapid and short courses, and their waters are cold throughout much of the year, and low temperatures are known to inhibit the development of trematode larval stages. These three factors, absence of species actually concerned in transmission and low temperatures make the spread of the fluke in America improbable, and this risk is further diminished by the disposal of human excrement and the infrequency of the consumption of raw fish by Europeans.

R. T. L.

NATIONAL MEDICAL JOURNAL OF CHINA. 1923. Dec. Vol. 9. No. 4. pp. 342–343.—**Noted Authority favors Lifting Ban on Chinese with Clonorchiasis.**

This is a letter written to the China Club of Seattle by Professor E. C. FAUST pointing out that Chinese persons infested with Clonorchis need not be excluded on that account from the United States, since the dangers of extension of clonorchiasis in America are negligible owing to the absence, or comparative absence, of the first intermediate host—Melania. [It may be noted, however, that *Schistosoma haematobium* occurs sporadically in India and in Portugal, where Bullinus spp. are absent. It does not follow that Clonorchis is limited in its potential distribution to the regional distribution of the genus Melania.]

R. T. L.

SHATTUCK (George Cheever). **Results of Treatment for Clonorchiasis. Preliminary Report.**—*Amer. Jl. Trop. Med.* 1923. Nov. Vol. 3. No. 6. pp. 475–494. [22 refs.]

Three Chinese immigrants infected with Clonorchis were treated with intravenous injections of tartar emetic, but the results were not very encouraging. One was apparently cured after a total of 19·5 gr. had been given in 52 days. The second was treated for 97 days, the total quantity being only 20 gr., as the patient showed intolerance ; the ova did not diminish in numbers, in fact they seemed to increase, nor did they show any alteration in appearance. Three doses of arsphenamine subsequently given at intervals of a week, totalling 1·1 gm., were followed by negative findings from two days after the last dose. The third patient was given 30·25 gr. of antimony tartrate in 44 days and took the drug well, but ova still continued to pass unaltered in any way.

H. H. S.

FAUST (Ernest Carroll). **A Preliminary Note on the Life History of *Clonorchis sinensis* in Chekiang Province, China.**—*Amer. Jl. Hyg.* Baltimore. 1924. Jan. Vol. 4. No. 1. pp. 69–71.

In Chekiang Province of China, clonorchiasis is not a serious human infection, but it is very prevalent in cats. A species of *Melania* was found to harbour the larval stages and the ocellate cercaria was shewn to encyst in fishes not only of the Cyprinidae but also of unrelated families. The scaling of fish for human consumption and the consequent removal of the encysted cercariae which are attached to the scales explains probably the relatively slight infestation of man as contrasted with that of cats in the region investigated.

R. T. L.

KOBAYASHI (Harujiro). [**On Clonorchiasis in China.**]—*Chosen Igakkwai Zasshi* (*Jl. Chosen Med. Assoc.*). 1923. Apr. No. 42. [Summarized in *Japan Med. World.* 1923. Dec. 15. Vol. 3. No. 12. p. 279.]

The author deals with the results of his investigations in Shanghai, Kaochao, Soochow, Hankow, etc. The fish which act as the second intermediate host [not specifically mentioned in the English abstract] abound in the Yangtze-Kiang River.

R. T. L.

KUWAHARA (Shōsaburo) & MŪTO (Masatomo). [**Ueber die Immunität von Leberdistomiasis.**]—*Ni. Byor. Gak. K.* Tokyo. 1921. Vol. 11. pp. 447-449. [Summarized in *Japan Jl. Med. Sciences.* Tokyo. 1921. Vol. 1. No. 1. p. 59.]

Complement fixation investigations were carried out on patients and animals suffering from liver distomiasis in order to demonstrate the existence of immunity. Investigations on recent or light infections were negative, whereas in old infections they were distinctly positive. The author is inclined to support the idea that immunity occurs.

R. T. L.

TOYAMA (Gunpei). [**Ueber den Blutbefund bei Leberdistomiasis.** Blood Changes in Hepatic Distomiasis.]—*Okayama Ig. Kw. Z.* 1921. pp. 384–407. [Summarized in *Japan Jl. Med. Sciences.* Tokyo. 1922. Vol. 1. No. 1. p. 59.]

In liver distomiasis the anaemia never becomes severe and it has been less studied than that due to other parasitic diseases. Leucocytosis is practically absent. Eosinophilia is absent or only slightly present. Pathological red cells are rarely seen. There is no definite relation between the intensity of infection, the number of eggs and the changes in the blood. An emulsion of liver distomes and an alcoholic extract of urine from patients suffering from liver distomiasis exert no special reaction on the erythrocytes of the rabbit.

R. T. L.

CIUREA (J.). **Heterophyidés de la faune parasitaire de Roumanie.**—*Parasitology.* 1924. Jan. Vol. 16. No. 1. pp. 1–21. With 5 plates. [43 refs.]

This paper is of importance to those interested in the classification of the trematode family *Heterophyidae.* The author subdivides the family into five subfamilies, viz.:—(1) *Heterophyinae*: genus

Heterophyes; (2) *Metagoniminae*: genus *Metagonimus*; (3) *Centrosestinae* [*Centrocestinae*]: genera *Centrocestus*, *Ascocotyle* and *Pygidiopsis*; (4) *Apophallinae*: genera *Apophallus* and *Rossicotrema*; (5) *Cryptocotylinae*: genera *Cryptocotyle*, *Scaphanocephalus*. He is of opinion that the genus *Paracoenogonimus* Katsurada should be excluded from the family, for KATSURADA's species *P. ovatus* is simply a holostome of the genus *Prohemistomum*, but he restores *Scaphanocephalus*, excluded by RANSOM, and shows that RANSOM's genus *Cotylophalus* 1920 is a synonym of *Rossicotrema* 1919. *Cryptocotyle lingua* of America is not identical with that of Europe and is named *C. americana*; the south American species of *Ascocotyle* recorded by FARIA does not appear to belong to the species *A. minuta*. In an interesting section the author discusses the identity of the flukes reputed to parasitize both mammals and birds (viz., *Ascocotyle minuta*, *Apophallus mühlingi*, *Cryptocotyle lingua* and *C. americana*) and agrees with LOOSS that the problem will only be satisfactorily settled when the complete life-histories have been traced. The paper contains many new observations of value to the systematist.

R. T. L.

KHALIL (M.). **The Source of Infection with** *Heterophyes heterophyes* **in Egypt.**—*Lancet.* 1924. May 10. p. 952.

This brief note summarizes the results already published in the *Journal of Helminthology* (see this *Bulletin*, Vol. 20, p. 937) of feeding kittens with infected Egyptian mullet (*Mugil cephalus*) in which KOBAYASHI had also reported the encysted cercariae of *Heterophyes*. Four hours after feeding, cercariae freed from their cysts were recovered from the small intestine. After twenty-four hours the genital organs of the parasites could be differentiated. In seven days many of the worms contained ova, although smaller than normal. Those recovered on the 14th day had attained normal adult size. The infection of the mullet is of interest, as it is a salt-water fish found only occasionally in the Nile estuary and frequenting the salt-water lake Manzalah, near Port Said.

R. T. L.

CHRISTOPHERSON (J. B.). **Longevity of Parasitic Worms: the Term of Living Existence of** *Schistosoma haematobium* **in the Human Body.**—*Lancet.* 1924. Apr. 12. pp. 742–743. [4 refs.]

It is related of a case of urinary bilharziasis contracted in the Northern Transvaal in 1878, that 28 years later the patient, a graduate of medicine and well versed in the microscopic examination of urine, found in his urine ova which gave rise to live miracidia. Several of the cases of bilharziasis contracted during the Boer war were passing live eggs after 18 years. The author assumes that the presence of living miracidia in the ova give an indication of the length of life of the adult worms.

R. T. L.

BASSETT-SMITH (Percy). **Naval Medical History of the War. Section of Tropical and Sub-Tropical Medicine. Part VII. Bilharziasis.**—*Jl. Roy. Nav. Med. Serv.* 1924. Jan. Vol. 10. No. 1. pp. 40–42.

Only four cases of bilharziasis appear to have been noticed among the naval ranks and ratings landed in Egypt, none in Natal or Mesopotamia. Brief notes are given of these. In one it is of interest to note that pus and blood occurred in the urine after a cure with antimony, ova could not be found in the urine, but tubercle bacilli were always present. This tubercular cystitis was a secondary condition supervening upon the bilharzial infection.

R. T. L.

BOULAY (A.) & LEGER (Marcel). **Evaluation de la quantité de sang rendue par l'urine dans un cas de bilharziose vésicale.**—*Bull. Soc. Path. Exot.* 1923. Jan. 10. Vol. 16. No. 1. pp. 63–65.

For estimation of the amount of blood passed in the urine of a patient suffering from *S. haematobium* the authors determined the iron in the haemoglobin. 100 cc. of a 24 hours' mixed urine is treated with chlorate of potassium and hydrochloric acid to destroy the organic matter. The resulting fluid is oxidized by boiling after addition of nitric acid. The volume is made up to 100 cc., and 10 cc. of a 5 per cent. solution of ammonium sulphocyanate is added. The colour obtained is compared with that given by the addition of one-tenth of its volume of the same solution of ammonium sulphocyanate to 0·1 gm. per litre of iron in the ferric state. The quantity of the iron in the urine of this case was 0·033 gm. per litre. Since, normally, 1 gm. of Fe represents 263 gm. haemoglobin, there were 8·68 gm. per litre of urine. There being 15 gm. per cent. of haemoglobin in normal blood, the blood content of the urine of the patient was $\frac{8{\cdot}68 \times 100}{15} = 57{\cdot}86$ gm. This patient passed 2,300 cc. urine in the day and the loss of blood, therefore, amounted to 133 gm.

This was a low estimate because, owing to the anaemia, the haemoglobin was probably nearer 10 than the normal 15 gm. per cent., and the authors state that the patient was losing approximately 175 gm. of blood in 24 hours. Estimations could not be carried out for successive days because treatment with tartar emetic was begun early, and the results were so successful that blood was no longer visible to the naked eye after a few days and the patient was discharged cured 12 days after commencement of treatment.

H. H. S.

LE BAS (Geraldine Z. L.). **A Note on the Employment of *Fasciola hepatica* as an Antigen for the Serum Diagnosis of Bilharziasis.**—*Proc. Roy. Soc. Med.* (Sect. of Trop. Dis. & Parasit.). 1924. Jan. Vol. 17. No. 3. pp. 6–10. [15 refs.]

Diametrically opposed findings have been recorded by various workers with antigens of helminthic origin. The author, from a study of three cases, states that " Alcoholic extracts of *Fasciola hepatica* are capable of fixing complement in a greater degree with sera from persons infected with schistosomes than with normal sera " [but the tables inserted to illustrate this do not lend much support to the contention, for only when the maximum quantity of antigen was employed was any difference noted at all with sera from two patients infected with *S. haematobium*]. With an absolute alcohol extract one serum gave — — — —, another + — — —, while with a 90 per cent. alcohol extract the former gave + + + — and the latter — — — —, the difference between a 3 plus and a 4 minus being apparently due to the extraction being made with 90 per cent. in place of absolute alcohol. With a *S. mansoni* serum, again with the maximum amount of antigen, + — — — was given with an absolute alcohol extract and ± — — — with 90 per cent. This test, therefore, would not be of any value for diagnostic purposes, especially as the tables show further that syphilitic sera may have a far stronger fixation power than those of patients suffering from schistosomiasis. This fact is further supported by the author's final conclusion that alcoholic extracts of helminthic and molluscan tissues very often give Wassermann antigen. A third conclusion which appears to bear out the above is worded thus : " *Schistosoma mansoni* infection superadded to syphilis gives no greater degree of fixation than is accounted for by the degree of fixation due to the capability of the serum for fixing complement in the presence of a Wassermann antigen."

H. H. S.

CAWSTON (F. G.). **The Prevention of Bilharziasis.** [Correspondence.] —*Lancet.* 1923. Dec. 22. pp. 1376–1377.

Though the common mollusc hosts of schistosomes soon die in a dry tropical climate, some can survive for 48 hours in the shade under conditions of moist heat. Operculated snails can remain alive for several weeks, but the writer records that a non-operculated snail, Barnupia, has great powers of resistance to drying owing to its close attachment to reeds. Hence, although complete drying of pools for a few days at a time will kill the mollusc hosts of *S. haematobium* and *S. mansoni*, this plan will not succeed in all cases of non-operculated snails nor for the host of *S. japonicum.* [The suggestion of drying was made solely as a means of Bilharzia prophylaxis in Egypt. R.T.L.]

H. H. S.

LANGERON (Maurice). **Troisième Mission parasitologique en Tunisie. Recherches sur les cercaires des piscines de Gafsa et enquête sur la bilharziose tunisienne (septembre-octobre 1920).**—*Arch. Inst. Pasteur de Tunis.* 1924. Apr. Vol. 13. No. 1. pp. 19–67. With 28 text figs. [34 refs.]

An investigation of the molluscan fauna of the thermal springs of Gafsa revealed only *Melanopsis doumeti*, *M. tunetana* and *Melania tuberculata*—none of which have been implicated in the spread of bilharziasis. Detailed descriptions are given of the various developmental stages found in these molluscs. The absence of suitable intermediaries or of developmental stages of schistosomes in the local molluscs forces the author to conclude that bilharzia infection is not acquired by bathing in the thermal springs of Tunis. The *Bullinus brocchii* found in the irrigation channels would appear to be the probable source of the infection.

R. T. L.

ANDERSON (Ch.) & GOBERT (E.). **Des mesures prophylactiques applicables contre la bilharziose en Tunisie.**—*Arch. Inst. Pasteur de Tunis.* 1924. Apr. Vol. 13. No. 1. pp. 125–128. [1 ref.]

Prevention of bilharziasis is an important question for Tunis. The vesical type is extremely prevalent. *Planorbis philipii* is present but there is no coincidence between its distribution and that of *Schistosoma mansoni*, for this is unknown in Tunis. The numerous foci of *Bullinus* (*B. contortus, B. dybowski, B. brocchii*) coincide with the endemic centres of *S. haematobium*. The author considers the various methods by which the intermediary in Tunis might be brought under control and advocates a method on the lines suggested by LEIPER for Egypt, where the scientific utilization of the periodical rotations of government controlled water might result in the eradication of the molluscs by drying.

R. T. L.

ANDERSON (Ch.) & GOBERT (E.). **Note relative à la prophylaxie de la bilharziose en Tunisie.**—*Bull. Soc. Path. Exot.* 1924. Jan. 9. Vol. 17. No. 1. pp. 35–37. [2 refs.]

After speaking of Professor LEIPER'S work in Egypt the author considers how the measures suggested in that country may best be applied to Tunis. *Schistosoma haematobium* is the only species common there, and the cycle of infection is best broken at the molluscan stage. A system of cleaning and filling of pools and canals is recommended as the most practicable preventive measure.

H. H. S.

MAËS (Eugène). *Schistosoma haematobium* **au Soudan français; enquête sur la bilharziose vésicale dans le cercle de l'Issa-Ber (Boucle du Niger).**—*Ann. Parasit. Humaine et Comparée.* Paris. 1924. Jan. Vol. 2. No. 1. pp. 82–85.

Vesical bilharziasis is very prevalent in French Soudan. Of 200 cases investigated in the region of Issa-Ber 127, *i.e.*, 63·5 per cent., gave evidence of infection with *S. haematobium*. The intermediary concerned there has not been implicated yet.

R. L. T.

DOLBEY (Robert V.) & FAHMY (Ibrahim). **Bilharzial Papillomatosis of the Rectum.**—*Lancet.* 1924. Mar. 8. pp. 487–488. With 1 fig. [2 refs.]

Though tartar emetic will destroy the ova of *Schistosoma*, the papillomatous condition set up and the distressing symptoms resulting therefrom continue. Complete and permanent cure is only obtained by excision of the whole tube of affected rectal mucous membrane. The operation has been performed on eight cases by one or other of the authors, as much as 17 inches being removed in one instance. The muscular coat is left intact and the mucous membrane above the excised part is drawn down and sutured to the margin of the skin and external sphincter. In only one case was there any after-trouble; in this the tension was so great that the sutures gave way, retraction of three inches resulted and a troublesome stricture developed. Even children of 10 and 12 years of age were operated upon and the results were very good. As there is a considerable degree of shock and haemorrhage patients with severe anaemia should not be submitted to operation.

H. H. S.

CHRISTOPHERSON (J. B.). **The Treatment of Bilharzia Disease.**—*S. African Med. Rec.* 1923. Dec. 22. Vol. 21. No. 24. pp. 566–568.

The author calls attention in this paper to some points of special interest in the treatment of schistosomiasis, particularly by antimony tartrate. He shows that 79 per cent. of unselected cases are cured by a full course. He regards as " cured " a patient who a year after cessation of treatment shows no symptoms of the disease—no live ova, no haematuria. A few dead ova may be still passing and thus a few red blood corpuscles may be present. By a " full " course he implies 4–5 weeks' treatment, and a total of 30 grains of the drug. Cases should not be recorded as " failures " because a shorter course and a smaller amount have not proved effectual. As compared with emetine the author thinks that the former is undoubtedly preferable, since emetine, in addition to giving a smaller percentage of cures, " is more dangerous, more expensive, and more objectionable to the patient."

H. H. S.

CHRISTOPHERSON (J. B.). **The Curative Dose of Antimony Tartrate in Schistosomiasis (Bilharzia Disease).**—*Brit. Med. Jl.* 1923. Dec. 29. pp. 1254–1255.

The author explains the reason for continuing the treatment of patients infected with schistosomes until a full course of tartar emetic totalling 30 grs. has been given, in spite of the disappearance of symptoms and apparent cure. The number of worms present is usually great and they differ in individual susceptibility to antimony; many will be killed by less than the full amount, but the more resistant may merely suffer a temporary reduction of their activities and recover if treatment ceases. Patients should, therefore, not be regarded as " cured " unless on examination the urine is free from live ova a year after cessation of treatment, nor, on the other hand, should treatment be said to have " failed " if ova return after an interval when the full dose has not been given (30 grs. intravenously, during 4–5 weeks).

H. H. S.

CAWSTON (F. G.). **The Treatment of Bilharzia Disease in the Young.**—*Jl. Trop. Med. & Hyg.* 1924. Apr. 1. Vol. 27. No. 7. pp. 73–74.

Intravenous administrations of antimony to children is at times a difficult procedure, even when special needles are used, and in some places abroad a continuous supply of these is not always obtainable. The author, therefore, made trial of emetine intramuscularly, starting with gr. ¼ and, when larger doses were reached, combining this with sparteine to counteract the depressant effect of the former on the heart. Children can rarely tolerate doses higher than ⅔ gr. The course given extended over a period of 24–26 days, and the total amount given was, in nearly every case, the same number of grains as the years of the child's age. At the end of a week many degenerating ova were seen; during the second week a few living ova, very few in the third week, and, as a rule, none in the fourth, provided the treatment had been maintained.

H. H. S.

ZIEMANN (Hans). **Zur Antimon (Stibenyl)-Therapie bei einigen tropischen Krankheiten.** [Bilharziasis.]—*Deut. Med. Woch.* 1924 Feb. 1. Vol. 50. No. 5. p. 136.

A sketchy account is given of the use of Stibenyl in certain tropical diseases. Two cases of urinary schistosomiasis, one quite mild, rapidly improved after successive doses of 0·1, 0·2 and 0·3 gm. administered intravenously. In two patients suffering from subtertian malaria and in three with *Loa loa* no benefit was obtained.

H. H. S.

DAVIES (L. W.). **Bilharziosis—Cases of.**—*Nigeria Ann. Med. & San. Rep. for the Year 1922.* pp. 32–33.

The author treated 14 patients, whose ages varied between eight and seventeen years, suffering from urinary schistosomiasis, with tartar emetic; the maximum dose was 2 grains and the total 12–14 grs., administered intravenously except in two instances where, owing to difficulty in entering the vein, he gave 5–7 grs. dissolved in distilled water on alternate days per rectum. The total amount thus administered is not stated, but the treatment was continued "for a fortnight or so" by which time the ova were disintegrated.

H. H. S.

CAWSTON (F. G.). **Destroying the Bilharzia in its Various Stages.** [Correspondence.]—*S. African Med. Rec.* 1924. Mar. 8. Vol. 22. No. 5. pp. 111–112.

A somewhat fanciful comparison is drawn between the cleansing of infested rivers and the curing of patients infected with *Schistosomum haematobium*.

H. H. S.

GRUBER (Gg. B.). **Klinisch-pathologische Beiträge zum Gebiet der Urologie. Ueber Harnblasen-Bilharziosis.** [Bilharziasis of the Bladder.]—*Ztschr. f. Urol. Chirurg.* Berlin. 1923. Vol. 13. pp. 99–102. With 2 text figs.

A man, aged 24 years, who had served in Palestine during the war, was taken into hospital on account of haematuria. By cystoscope a flat, warty tumour with a raw but not ulcerated surface was seen, which bled readily, and close to it was a small nodule which, it was thought, might be tuberculous. The part affected was excised and the patient made a good recovery. A detailed description is given of the morbid histology of the excised portion which proved to be a papillomatous growth due to *S. haematobium*.

H. H. S.

MELENEY (Henry Edmund). *Schistosomiasis japonica* : **Egg Deposition and the Subsequent Pathology in the Intestines of Experimentally Infected Dogs.**—*Proc. Soc. Experim. Biol. & Med.* 1924. Feb. Vol. 21. No. 5. pp. 270–272. [1 ref.]

From the study of the pathology of experimentally infected dogs killed in 28 to 65 days after infection two hitherto unnoticed features are described :—

On the 29th day after infection nearly all the deposited eggs occurred in the stroma of the mucosa : a few were in the submucosa. In many cases all the eggs were within distended venules and capillaries. At this stage there was no haemorrhage and practically no tissue reaction. The copulating worms were in distended veins in the submucosa.

In sections of dogs killed 40 to 65 days after infection abscesses had developed about the eggs in all the coats of the intestine and there was a tendency to proliferate into abscesses in the submucosa. In the dog at the 65th day some of these abscess cavities were completely lined with intestinal epithelium and the contents discharged through the lesions of the glands. It is probable that this epithelial proliferation into the submucosa is an important factor in the formation of intestinal papillomas.

R. T. L.

KASAMA (Yoshiaki). [**Experimentelle Untersuchung ueber die durch vitale Erscheinung von** *Schistosomum japonicum* **hervorgerufenen pathologischen Veränderungen.** Investigation of the Pathological Changes induced in the Tissues by the Presence of *S. japonicum.*]—*Ni. Byor. Gak. K.* Tokyo. 1921. Vol. 11. pp. 463–465. [Summarised in *Japan Jl. Med. Sciences.* Tokyo. 1922. Vol. 1. No. 1. p. 62.]

The author performed experiments on rabbits by infecting them through the skin with cercariae of *Schistosoma japonicum* obtained from a specimen of *Blanfordia nosophora* with the object of trying to find in how far the well-known pathological changes of this parasite are due not to the deposited schistosome eggs, but to vital changes in the adult itself. In these experiments the cercariae always developed into one sex in the host.

In these animals thus protected from egg deposition fairly marked changes were seen in the liver, spleen, kidneys and thyroids. The author concludes that the cirrhotic liver changes, which YAMAGIWA says are due to interstitial hepatitis arising from embolism, are caused not only by egg deposition but also, to some degree, by vital processes of the parasite. The experimental results lead the author to suggest that it would be better to call it hepatic cirrhosis due to *S. japonicum.*

R. T. L.

KASAMA (Yoshiaki). [**Ueber das Darmkarzinom bei** *Schistosomiasis japonica* ; **zugleich eine genetische Beziehung zwischen seiner Entstehung und den Parasiteneiern.** Intestinal Cancer in Schistosomiasis Japonica ; Generic Relation between its Origin and the Schistosome Eggs.]—*Gann.* Tokyo. 1921. Vol. 15. pp. 159–228. With 1 fig. [Summarized in *Japan Jl. Med. Sciences.* Tokyo. 1922. Vol. 1. No. 1. p. 49.]

Intestinal carcinoma is found more often among the inhabitants in regions where schistomiasis is endemic. The nine cases of intestinal carcinoma examined were all adenocarcinomatous. In the intestinal tissue many old parasite eggs were found, especially between the malignant and healthy tissue. Several times heterotopia and transitional forms of the intestinal epithelium becoming tumour cells were seen. The author assumes that the cancerous formation from the adenomatous growth is the nature of a heterotopic glandular epithelium. The parasite eggs appear to affect the glandular epithelium as foreign bodies as well as by their metabolic changes.

R. T. L.

KAWAMURA (Rinya) & KASAMA (Yoshiaki). [**Ueber die rachitische Knochenveränderung bei den an** *Schistosomiasis japonica* **erkrankten jungen Kaninchen und Kindern.** The Rachitic Changes in the Bones in Young Rabbits and in Children infected with *S. japonica.*]—*Ni. Byor. Gak. K.* Tokyo. 1921. Vol. 11. pp. 465–466. [Summarized in *Japan Jl. Med. Sciences.* Tokyo. 1922. Vol. 1. No. 1. p. 62.]

The author examined the rachitic bone changes in three young rabbits, all from different mothers ; the mothers had previously been strongly infected subcutaneously with cercariae of *Schistosoma japonicum.* In development these were much behind the controls. Typical rachitic changes were seen, *e.g.*, the rachitic " rosary " at the junction of the bone and cartilage of the ribs, and a thickening of the epiphyses at both extremities. Histologically the tissue was typically rachitic. In every case the thyroid and genital glands were atrophied and with impaired function while the hypophysis was always hypertrophied.

Although no parasites were found in the portal system in the above cases it is supposed that the toxin of these worms passed to the young *in utero* through the placenta, and after birth by the milk.

R. T. L.

SUEYASU (Yoshio). [**Ueber die Beziehung zwischen** *Schistosomiasis japonica* **und der Feldratte.** *S. japonicum* Infection and the Field Rat.]—*Ni. Byor. Gak. K.* Tokyo. 1921. Vol. 11. pp. 467–470. [Summarized in *Japan Jl. Med. Sciences.* Tokyo. 1922. Vol. 1. No. 1. p. 61.]

In his first communication the author had shown that natural infection with schistosomes occurs in field rats in endemic centres, thus helping to spread the disease ; further, he advocated the destruction of these rats as an essential for prophylaxis. He is now able further to support his view. In the earlier investigations 5 out of 10 field rats harboured schistosomes, while in his later series 5 out of 65. This difference is explained by the fact that the first rats were caught in a heavily infected region, whereas the latter were caught in an endemic centre where disinfection with lime had previously been carried out ; this incidentally also serves to show the value of lime in stamping out the disease. Since on the other hand Dr. NAKAMATO has found a schistosome infection in the weasel, the writer has increased the scope of his recommendations by advocating the extermination of weasels and other field mammals, in addition to field rats, if the disease is to be stamped out.

R. T. L.

SUEMORI (Susumu). [**Studien ueber das** *Schistosomum japonicum* **in Formosa.**]—*Ni. Byor. Gak. K.* Tokyo. 1921. Vol. 11. pp. 458–459. [Summarized in *Japan Jl. Med. Sciences.* Tokyo. 1922. Vol. 1. No. 1. p. 63.]

According to the author's researches there is no real difference between the schistosome worms of Formosa and old Japan. There is only a biological characteristic revealed in the fact that the worms do not parasitize the indigenous population.

Infection experiments showed that animals infected with cercariae from a single intermediate host became parasitized by worms of one sex only, whereas those treated with cercariae from two or more intermediate hosts developed both male and female worms. Where worms of only one sex resulted, the parasites showed differences in the development of the body from those resulting from infections in which there were both sexes of worms present.

R. T. L.

MENGERT-PRESSER (Hilde). **A Case of Schistozomiasis Japonicum.**—*Meded. Burgerlijk. Geneesk. Dienst in Nederl.-Indië.* 1923. Part 3. pp. 227–235. With 6 plates. [19 refs.]

The findings of a post-mortem examination on a Chinaman in Weltevreden (Batavia) are recorded in some detail. These were indicative of tuberculosis, but subsequent microscopical examination showed large numbers of ova of *S. japonicum* in the vermiform appendix and in the liver. Giant cells were present in the kidney, spleen, and other organs where no ova were seen, but whether these were due to tuberculosis or not was not proved.

H. H. S.

ISOBE (Michi). [**Biological Observation of the Cercaria of** *Schistosomum japonicum.*]—*Taiwan Igakkwai Zasshi* (*Jl. of Formosan Med. Soc.*) 1923. Mar. No. 227. [Summarized in *Japan Med. World.* 1924. Jan. 15. Vol. 4. No. 1. p. 15.]

The range of temperature of the water required to induce the emergence of the cercaria of *S. japonicum* from its intermediate host was found to be 18°–35° C. Neither water nor light seemed to have any influence but darkness appeared to favour emergence.

R. T. L.

SUYEYASU (Yoshiwo) & NAKAMOTO (Hyakusuke). [**Supplementary Notices on the Prevention of** *Schistosomiasis Japonica.* **Practical preventive Work in the Infected Region in Bingo. (Concluded).**]—*Chugwai Iji Shimpo* (*Internat. Jl. Med.*). 1923. Aug. No. 1041. [Summarized in *Japan Med. World.* 1923. Dec. 15. Vol. 3. No. 12. p. 276.]

The following points are noted by the authors as of practical importance in the prevention of Asiatic schistosomiasis in Japan.—(1) Prohibition of use of cattle, (2) keeping of human manure for a considerable period before use, (3) destruction of intermediate host by chalk, etc., (4) improvement of irrigation, (5) instruction to inhabitants. [No details are given in the English summary.]

R. T. L.

KAWAMURA (Rinya) & KASAMA (Yoshiaki). **[Ueber die Heterotopie der Darmepithelien bei Schistosomiasis des Kaninchens.** Heterotopia of Intestinal Epithelium in Schistosomiasis of the Rabbit.]—*Ni. Byor. Gak. K.* Tokyo. 1921. Vol. 11. pp. 510–513. [Summarized in *Japan Jl. Med. Sciences.* Tokyo. 1922. Vol. I. No. 1. p. 50.]

Intestinal changes with special reference to heterotopia of the intestinal epithelium were studied in a rabbit which had been experimentally infected by immersion in water containing schistosome cercariae. There were marked changes such as epithelial heterotopia, adenomatous and papillomatous growth of the mucosa but none of a malignant character.

R. T. L.

YOSHIDA (Sadao) & OGATA (Seiji). **Two Rare Specimens of Human Cestodes.**—*Ann. Trop. Med. & Parasit.* 1924. Apr. 30. Vol. 18. No. 1. pp. 15–22. With 1 fig. & 1 plate. [2 refs.] Also *Osaka Igakkwai Zasshi* (*Jl. of Osaka Med. Soc.*) 1923. Dec. Vol. 22. No. 12. [*Summarized in Japan Med. World.* 1924. Mar. 15. Vol. 4. No. 3. p. 74.]

Dibothriocephalus parvus was originally recorded by STEPHENS from Persia. In 1915 Dr. LEON reported a case in Roumania. The authors describe a specimen from a boy age 9, in the city of Himeji, Japan. The strobila is without head and measures 2·315 metres in length having 1,150 proglottides. The original differentiation of the species was based on external characters, especially on the size of the worm and of the egg. These are not always sufficient to distinguish species but the authors incline to accept them in this case. The latter part of the paper deals with abnormalities in *Dibothriocephalus latus.* The fenestrated abnormality is probably caused by the disintegration of the uterine portion of the segment and the fusion of adjacent fenestrations with each other.

R. T. L.

SCOTT (H. Harold). **A Contribution to the Experimental Study of the Life-Histories of** *Hymenolepis fraterna* **Stiles, 1906, and** *Hymenolepis longior* **Baylis, 1922, in the Mouse.**—*Jl. Helminthology.* 1923. Dec. Vol. 1. No. 5. pp. 193–196. With 1 plate. [8 refs.]

It has been assumed that the cysticercoids found by MINCHIN in the rat flea *Ceratophyllus fasciatus* were possibly those of *Hymenolepis longior.* The author relates a series of careful feeding experiments which demonstrates conclusively that the cysticercoids of *Hymenolepis longior* like those of *Hymenolepis nana* develop in the intestinal mucosa of the mouse and that the mouse becomes infected directly through their liberation by the bursting of the villi in which they grow. Two excellent microphotos illustrate the paper.

R. T. L.

WOODLAND (W. N. F.). **On the Life-Cycle of** *Hymenolepis fraterna* (*H. nana* **var.** *fraterna* **Stiles) of the White Mouse.**—*Parasitology.* 1924. Jan. Vol. 16. No. 1. pp. 69–83. [11 refs.]

This paper is an amplification of the preliminary note on the life-history of *Hymenolepis fraterna* published in *Nature* (1923. Sept. 22. Vol. 112, p. 436), and gives the details of the experimental work on which the conclusions are based. By means of a series of experiments checked by careful controls the author procured direct infection in 19 out of 20 mice fed with eggs of *H. fraterna* obtained from another mouse. The rate of development was found to vary somewhat, in that individual worms arising from eggs ingested at the same time did not reach maturity in the same period. When the worm attained a length of 6–7 mm., ripe eggs were found in the older segments and were passed in the faeces on the fifteenth day. If the infection is mild the length of the adult may be 20–25 mm. but when it is very heavy, as when 100 or more individuals are found in a single mouse, the length of the majority does not exceed 10 mm. It would appear that an adult worm may get rid of most or all of its eggs in a week or so, and then degenerate and be itself passed out in the faeces, so that a mouse lightly infected may rid itself of the parasite.

The author was unable to confirm JOYEUX's statement as to the greater susceptibility to infection of very young mice, but found, on the contrary, that, as a general rule, the medium-sized animals (weighing 20-25 gm.) were best, the smallest and largest (except in one instance in which a mouse weighing over 35 gm. became infected with a weak concentration of eggs, showing the least liability to infestation.

H. H. S.

WOODLAND (W. N. F.). *Hymenolepis nana* **and** *H. fraterna.* [Correspondence.]—*Lancet.* 1924. May 3. pp. 922-923.

Thirty mice, free from *Hymenolepis fraterna*, were fed with fresh eggs of *Hymenolepis nana* from human cases and 27 mice of the batch were kept as control. 23 per cent. of the mice showed infection from the stools used, whereas the 27 controls remained free. These experiments are held to substantiate the view of SAEKI and UCHIMURA that *H. nana* and *H. fraterna* are one and the same species.

R. T. L.

BUTKA (H. E.). **Infestation with** *Hymenolepis diminuta* **(Rat Tapeworm).**—*Jl. Amer. Med. Assoc.* 1924. Mar. 15. Vol. 82. No. 11. p. 875. [1 ref.]

Small, whitish flakes in the stools suggestive of tapeworms were seen for five days before the patient, a boy 16 months of age, was brought to the hospital in Los Angeles because of hunger, loss of weight, restlessness and irritability. Eggs were numerous in the faeces and as a result of a vermifuge the worm was passed and measured 32 cm. in length with approximately 260 segments.

R. T. L.

INADAMA (Shingo). **A Case of** *Hymenolepis diminuta.*—*Japan Med. World.* 1923. Nov. 15. Vol. 3. No. 11. p. 240. With 2 text figs. Also *Jikkenigaku Zasshi* (*Jl. Experim. Med.*). 1923. Apr. Vol. 7. No. 4. [Summarized in *Japan Med. World.* 1924. Feb. 15. Vol. 4. No. 2. pp. 47–48.]

A case of *Hymenolepis diminuta* occurred in a girl aged 4. She was born in a village at the foot of Mount Fuji (where 77 per cent. of the inhabitants are said to be bearers of various parasites' eggs). She was nursed on her mother's milk. Occasionally she had abdominal pain of unknown cause, and her stools were irregular, sometimes diarrhoeic. There was no clinical symptom other than a little anaemia. After a sudden attack of acute diarrhoea on the 24th September, 1922, a tape-worm was discharged. Since that period no more eggs have been demonstrated in her faeces. The worm is " 25 cc." in length, with a maximum width of 3 mm.

R. T. L.

GREENWAY (Daniel). **Un caso autóctono de teniasis por** ***himenolepis diminuta.*** [A Case of Infection by *Hymenolepis diminuta.*]—Reprinted from *Prensa Méd. Argentina.* 1923. Dec. 30. 11 pp. With 5 figs.

Another instance of human infection by *Hymenolepis diminuta.* The patient was a child, 18 months of age, who seven months previously had an attack of fever for which the mother gave a purgative, and thereafter noticed pieces of a small tapeworm in the faeces. These continued to pass until the child was brought to the author for treatment and the nature of the infection was diagnosed.

H. H. S.

ASADA (Junichi). [*On Hymenolepis diminuta* **Rudolphi, which find the Host in a Dog.**]—*Okayama Igakkwai Zasshi* (*Jl. Okayama Med. Soc.*). 1923. Dec. No. 407. [Summarized in *Japan Med. World.* 1924. Feb. 15. Vol. 4. No. 2. p. 40.]

The author records the finding of this worm in a dog. It is frequent in the rat and is less common than is generally believed in man.

H. H. S.

MILLS (Ralph G.). **Notes on the Occurrence of** ***Taenia saginata*** **in North China.**—*China Med. Jl.* 1923. Nov. Vol. 37. No. 11. pp. 932–939. [7 refs.]

It is an erroneous assumption that beef obtained in Peking is not infected with tapeworm and is therefore safe for consumption without special inspection. The author has secured from a German butcher in Peking numerous samples of beef containing *Cysticercus bovis.* Moreover, *Taenia saginata* has been detected in 12 cases during two years, out of about 4,500 hospital patients. Two were foreigners and 10 were orientals ; all contracted the infection in Peking. While Chinese methods of preparing beef are effective in most instances, suspicion points to restaurants where there is haste and carelessness in food preparation.

R. T. L.

LEONARD (T. M. R). **A Case of Acute Hiccough due to Cestode Infection.**—*Nigeria Ann. Med. & San. Rep. for the Year* 1922. pp. 26–27.

A man of 25 years was admitted to hospital in a collapsed state, owing to vomiting and incessant hiccough for the preceding six days. No physical signs of disease were found, except an eosinophilia in the blood and the presence of ova of Ascaris, Trichuris, Ancylostoma and *Taenia saginata* in the faeces. A dose of *Filix mas* caused vomiting and " an adult tape-worm, complete, twenty-six inches in length " was found in the vomit. Recovery rapidly ensued. A second case is briefly reported in which an adult *T. saginata* was vomited after four days' continuing hiccough.

H. H. S.

YOSHIDA (Sadawo) & TAKANO (Ryozo). [**On** *Diplogonoporus grandis* **(R. Blanchard, 1894) Luhe 1899. (Continued).**]—*Tokyo Iji-Shinshi* (*Tokyo Med. News*). 1923. Dec. No. 2350. [Summarized in *Japan Med. World.* 1924. Feb. 15. Vol. 4. No. 2. p. 36.]

This case is said to be the fifth recorded of human infection by *Diplogonoporus grandis.* Since the previous four patients were all living by the sea and since species of tapeworms related to this are found in sea-fish and marine animals, the authors suggest that man becomes infected by eating such animals in a raw or imperfectly cooked state.

H. H. S.

SCHNEIDER (Hans). **Eine Modifikation der üblichen Bandwurmkur mittels der Duodenalsonde.** [Administration of Taenifuges by the Duodenal Sound.]—*Wien. Klin. Woch.* 1924. Apr. 3. Vol. 37. No. 14. pp. 338–339. [12 refs.]

In order to overcome the nausea often produced by oral administration of anthelminthic drugs, with, at times, rejection of the drug by vomiting, or to obviate the difficulty exhibited by some patients in swallowing the large capsules, the author recommends the use of a duodenal sound for introduction of the medicament. He states that smaller doses will produce effect, that the tapeworms are in the majority of instances expelled entire, and that toxic symptoms are less commonly met with.

H. H. S.

PATTERSON (S. W.) & WILLIAMS (F. Eleanor). **A Stable Preparation of Hydatids for the Complement-Fixation Test.**—*Jl. Path. & Bact.* 1924. Jan. Vol. 27. No. 1. pp. 1–4. [4 refs.]

Hitherto in order to obtain a satisfactory antigen for the complement-fixation test in hydatid infection it has been necessary to procure fresh and uncontaminated fluid each time. This may not be a great difficulty where the disease is rife, as in Australia, but in England, where the test is only occasionally called for, it constitutes at times an almost insuperable obstacle. Filtration through porcelain of a contaminated fluid reduces the antigenic properties nearly to nil, even if kept on ice ; addition of antiseptics changes the value to such an extent that anomalous results are given, and dried fluid when re-dissolved is found to be no longer antigenic.

The authors found that alcoholic extract of scolices proved a more reliable antigen than even fresh fluid, not only qualitatively but quantitatively. Thus, of 30 proved cases of hydatid submitted to parallel tests 25 gave a positive with fresh fluid—9 of them+++, 4 a ++, and 12 a + ; with alcoholic extract all 30 were positive—20 of them +++, 4 a ++, 6 a +.

The question being one of importance the authors' description of the method of preparation may be quoted verbatim :—

"As much hydatid sand (scolices) as possible is aspirated aseptically from liver and lung hydatid cysts of infested sheep, sedimented from the fluid by slow centrifugation, and washed four times with sterile 0·85 per cent. salt solution, centrifuging down between each washing. The washed scolices are mixed with an equal quantity of kieselguhr, ground to a paste in a mortar, and added to about ten times the quantity of absolute alcohol. The mixture is incubated at 37°C. for three days, being shaken several times a day ; and is then kept in the ice-chest for a week. The supernatant fluid is then poured off, and used as the stock antigen, which is kept in the ice-chest till required.

"For use, 1 cc. of the alcoholic extract is put in a watch-glass and allowed to evaporate on the bench at room-temperature. The residue is rubbed up with 1 cc. of distilled water, and titrated with complement. As it has never been found anti-complementary, we have used it diluted one-third with 0·85 per cent. salt solution. The residue after evaporation seems to emulsify better with distilled water instead of saline solution."

Moreover, fresh hydatid fluid, although isotonic, is found to have a certain haemolytic effect, especially when the test is carried out at 30° C. for an hour. With prolonged ice-box fixation (18 hours at 4° C.) there is no such action and the results are stronger and more definite.

H. H. S.

THIELLÉ (Th.). **Quelques recherches sur la réaction de Weinberg pratiquées à l'Institut Pasteur de Tunis.**—*Arch. Inst. Pasteur de Tunis.* 1923. Dec. Vol. 12. Nos. 3–4. pp. 313–327.

WEINBERG'S test for echinococcus infection, of proved value in Paris, had yielded consistently negative results in the hands of workers in Tunis. The author, therefore, undertook examinations of sera from human cases with sheep hydatid antigen obtained from WEINBERG'S laboratory. Heating to 56° C. for an hour reduced the antigenic titre by two-thirds. Tests were carried by both the rapid and the slow methods with sera from 14 patients with hydatid cysts, and in a few instances the precipitin and cutaneous reactions were also tried. Antigens from man, ox, pig, as well as sheep, were used. It was found that better results were obtained if previous heating of the antigen was omitted. Fluid from man and pig proved stronger antigens than that of bovine origin, and, a most important point, it was found that echinococcus serum loses much of its antibodies when heated and may thus give a negative finding although a cyst is proved by operation to be present. The rapid method with unheated serum was, therefore, the better.

A second part of the paper gives a brief account of experiments for the purpose of obtaining an antiserum by injection of hydatid fluid into rabbits. Bovine fluid was employed and it was found that a more potent serum was yielded by rabbits injected at fairly short intervals, that such a serum was more active both for the precipitin and for Weinberg's reactions with bovine than with human fluid, and that, finally, a more active serum was produced by subcutaneous than by intravenous inoculation.

H. H. S.

CAMERON (Gordon). **The Staining Reactions of Hydatid Cysts.**—*Med. Jl. Australia.* 1923. Nov. 24. 10th Year. Vol. 2. No. 21. pp. 541–544. [5 refs.]

The author has investigated the micro-chemical aspect of hydatid disease, showing by means of staining reactions the various constituents of cyst walls and scolices. The subjoined table gives the staining reactions the deductions from which may be summarized as follows :—The endocyst and scolices tend to stain more by basic aniline dyes, the ectocyst by acid dyes. Fat appeared to be distributed throughout cyst wall and scolices, glycogen similarly but more in the endocyst. The Prussian-blue reaction for iron was much more evident in the endocyst and scolices than in the ectocyst. It is suggested that the leucocytic eosinophile reaction is the result of the substance in the ectocyst which reacts with eosin, or has some purposive connexion with it, thus possibly supporting KÄMMERER'S view that in helminth infections neutrophile cells in the inflammatory zone take up toxic substances and convert them into eosinophile substance. The cyst wall is shown to contain protein, fats, carbohydrates and inorganic salts, especially iron and calcium. Details of the staining methods are given and the paper is a valuable contribution to the subject.

Stain.	Ectocyst.	Endocyst.	Scolices.
Haematoxylin and eosin	Diffuse pink (eosinophile) staining.	Patchy pink (eosinophile) staining, but with marked blue (haematoxylin) areas.	Patchy pink and blue staining, blue predominating.
Sudan III.	Extensive red granular staining.	Extensive red granular staining.	Diffuse deep red staining.
Van Gieson and haematoxylin.	Deep pink staining.	Deep pink, but with patchy blue staining.	Yellow or red or both combined.
Gentian violet.	Violet.	Light violet.	Diffuse deep violet or blue.
Gram's stain.	Diffuse pink (eosinophile).	Violet and pink patches.	Violet.
Langhan's stain.	Extensive brown granules.	Extensive brown granules.	Extensive brown granules.
Potassium ferro-cyanide.	Pale green staining	Blue patchy staining.	Deep blue staining.
Von Kossa's method (for calcium phosphate)	Minute black granules.	Minute black granules.	Minute black granules.
Giemsa's stain.	Light purple.	Blue.	Deep blue.

H. H. S.

DÉVÉ (F.). **Enquête étiologique sur l'échinococcose en Tunisie.**—*Arch. Inst. Pasteur de Tunis.* 1923. Dec. Vol. 12. Nos. 3–4. pp. 353–386. [29 refs.]

This article is divided into 5 sections. In the first the author points out that a large proportion of the cattle of Tunis are infected with hydatid, in fact nearly all the old beasts brought for slaughter; also that 20–60 per cent. of sheep and 30 per cent. of the camels harbour the cysts. The goat is much less affected and the pig probably not at all. In the second section the question of the hosts of the Taenia is discussed and the three incriminated are the dog, the cat and the jackal; the former two from food thrown to them at slaughter-houses. Next, the mode of infection is dealt with and the chief source is shown to be contamination of the pastures by the faeces of dogs and jackals. The eggs in faeces will resist the drying of the sun for at least 11 days. A fourth section treats of the disease in man. Records of the frequency are very variable; thus, at the Sadiki Hospital there were 150 cases in 20 years, whereas Dr. PAGE, of Maktar, met with 26 and 31 in two successive years. The Arabs are much more infected than are Europeans, owing to the closer contact of the former with their dogs, and, for the same reason, females show a higher incidence than males. The majority of cases are met with between the ages of 20 and 40 years, but the author thinks that children are much more often infected than recent statistics show. Other sources than the dog are practically negligible as regards the human disease. Dirt-eating by children, the consumption of uncooked vegetables and fruits, and drinking of polluted waters, especially surface waters, are potent sources of Arab infection, but the main cause is the caressing of dogs, allowing them to lick hands and face, or to feed from plates and dishes, contamination from soiled paws, etc. Lastly, for prevention there are three chief measures proposed: (1) reduction in the number of dogs, especially pariah and slaughter-house dogs (better still, keeping them from slaughter-houses altogether); (2) suppression of private slaughter-houses; (3) thorough inspection of meat and destruction of the viscera of slaughtered animals instead of throwing them to dogs.

H. H. S.

GREENWAY (Daniel). **Demografia de la hidatidosis humana en la Republica Argentina.** [Human Echinococcosis in the Argentine.]—15 pp. With 2 graphs. 1923. Buenos Aires: " Las Ciencias " Establ. Tipo-Litografico y Casa Editora de A. Guidi Buffarini, Calle Junin 845.

This paper deals almost entirely with statistics. A return of the number of cases of hydatid for the twelve years 1910-1921 inclusive is given [the detailed figures given in the table do not equal the total recorded on which the percentages are based]. Then follows a table showing the localization of the cysts; 64·5 per cent. were in the liver, the next highest being 14·6 per cent. in the lungs. More than half the patients were Argentinos, and some 60 per cent. came from Buenos Aires. The disease certainly appears to be on the increase; during the period in which the population has doubled the cases of hydatid have quadrupled, though part of this probably represents improvement in diagnosis. Reports from slaughter-houses show that hydatid disease has increased also among cattle and sheep during the same period of twelve years.

H. H. S.

FAIRLEY (K. Douglas). **Hydatid Disease of the Liver.**—*Med. Jl. Australia.* 1924. Feb. 23. Year 11. Vol. 1. No. 8. pp. 177–186. [16 refs.]

In this paper, based on an analysis of 167 patients suffering from hydatid disease of the liver, the author has dealt as comprehensively as possible in the space with an important subject. Multiple infestation was found to be common. The condition is latent in the early stages, fully half of the patients not seeking advice until the supervention of some complication called their attention to its presence. The most frequent of these complications was suppuration, though the usual indications—fever, rigors, sweating, leucocytosis—may be slight or absent owing to the thick adventitia preventing rapid absorption of toxic products. In the majority of uncomplicated cases pain is the first symptom, more rarely the presence of a tumour, or of jaundice. Pressure signs are mainly pulmonary, the chief being pleurisy and collapse of the lower lobe of the lung adjacent. Brief records are given of 6 cases to illustrate special features:—(1) An uncomplicated cyst of the right lobe in a woman of 45 years; (2) A suppurating cyst, complicated by ulcerative endocarditis and terminating fatally; (3) Suppuration with rupture into the peritoneal cavity in a man of 50 years; (4) Rupture of a non-suppurating cyst into the peritoneal cavity, the result of trauma; repeated operations have had to be performed on this patient for multiple cysts of the peritoneum; (5) & (6) To illustrate difficulties of diagnosis from history and physical signs, the former resembling cholelithiasis, the latter carcinoma of the stomach. Many patients are operated upon for suspected gall-stones or cholecystitis; the author, therefore, recommends that, if at such operation little is found to account for the symptoms, the possible presence of hydatid of the liver should be borne in mind and that organ thoroughly explored.

In diagnosis reliance is to be placed on clinical signs, the use of X-rays (especially for the localization of cysts), and on biological tests. Exploratory needling is strongly condemned on account of the likelihood of the multiple sowing of peritoneal cysts following leakage of the fluid. Treatment receives brief mention. Complete removal is best, but is rarely possible; the next operation of choice is formalinization and closure of the cyst, the chief contra-indications being quoted from BARNETT'S article in BYAM & ARCHIBALD'S "Practice of Medicine in the Tropics"; lastly, where closure is definitely contra-indicated, "marsupialization"* is recommended. [Unfortunately, this term is not defined; the Australian practitioner is, perhaps, familiar with it, but for others the natural interpretation might be "disposal of the tumour to a kangaroo."].

H. H. S.

TASHIRO (Kikuo). **[Ueber den feineren Bau von *Sparganum proliferum.*** The Finer Structure of *Sparganum proliferum.*]—*Ni. Byor. Gak. K.* Tokyo. 1921. Vol. 11. pp. 492–493. [Summarized in *Japan Jl. Med. Sciences.* Tokyo. 1922. Vol. 1. No. 1. p. 65.]

The author concludes from his microchemical researches that the so-called "reserve nutritic matter" is nothing more than an excretory product. He has also discovered a hitherto undescribed cell group, which he calls "formative cells." These are thought to play an important part in the budding (*Knospung*) so characteristic of *Sparganum proliferum.*

R. T. L.

TASHIO (Kikuwo). **[Clinical, Pathoanatomical and Experimental Studies on** *Plerocercoides Prolifer* **Iijima or** *Sparganum* **Stiles.**]—*Tokyo Iji Shinshi (Tokyo Med. News).* 1923. Feb., Mar. & May. Nos. 2317, 2318, 2319, 2321, 2323, 2328 & 2330. [Summarized in *Japan Med. World.* 1923. Nov. 15. Vol. 3. No. 11. p. 248.]

Larvae of *Plerocercoides prolifer* have been found in almost every tissue of the body except the bone marrow. In the body of the worm are found innumerable glycogen granules. There are both typical and atypical calcium granules. In the gut of the monkey, cat, dog, white rat, chick, snake, etc., the young larva is digested. It is, however, transplantable into the hypodermic tissue or abdominal cavity of the monkey, dog and guinea-pig and develops and proliferates there.

R. T. L.

FÜLLEBORN (Friedrich). **Biologische Erwägungen ueber die "Wanderung" der Larven parasitischer Nematoden im Körper des Wirtes.** [Biological Considerations on the Migration of Parasitic Nematode Larvae in the Body of the Host.]—*Arch. f. Schiffs- u. Trop.-Hyg.* 1924. Jan. Vol. 27. (1923.) No. 12. pp. 444–452. [21 refs.]

Travelling or migration (Wanderung) in so far as it conveys an idea of active locomotion is often wrongly used from the helminthological aspect. There is true migration in boring from the intestine through the wall, as, *e.g.*, when Ascaris larvae escape from the ova, or when Ankylostome and Strongyloides larvae penetrate the skin, but much of the so-called migration is mere mechanical transference as by the blood- or lymph-stream, by movements of the cilia of the respiratory epithelium, or by the act of swallowing. Thigmotropism (boring movements on meeting with obstruction), thermotropism (attraction to a warm spot), entrance into a "transport host," are regarded as not necessarily purposive for developmental ends, but as a kind of "trial and error" by which the proper host is finally reached. The term "transport host" is not the same as "intermediate host"; it implies a host in which the parasite can remain alive for, perhaps, a long period, but merely as a chance habitation, not as necessary for development. With regard to Histotropism, in some cases, as, for example, ascaris, ankylostome and strongyloides larvae, passage through the lungs appears to be essential for further development, whereas in the case of Belascaris larvae growth proceeds in the lungs of the foetal dog (that is, where there is absence of free oxygen), but as soon as breathing is established, they retire elsewhere. In the case of Trichotrachelidae, on the other hand, sojourn in the lungs is not necessary for development; it is true that Trichinella larvae pass through the lungs to reach the general musculature by the systemic circulation, but they do not stay there. For those larvae which are to develop in the intestine this would be a mere "by-path" or "side-track," though the fact may account for infection of an unusual host by the parasite in question, for example the presence of Belascaris in mice who have fed on the carcases of dogs.

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* Defined by DORLAND thus:—The operation of stitching the edges of an ovarian tumour to the edges of the abdominal wound so as to leave a pouch. The sac suppurates, fills with granulations and shrinks.—ED.

That histotropism is a definite process is supported by the fact that different worms seem to choose, as it were, definite tissues or organs in which to develop. Thus, the embryos of *Dirofilaria immitis* develop in the Malpighian tubes of the mosquito, whereas those of *F. bancrofti* do so in the thoracic musculature.

The author acknowledges that there are many gaps to be filled, but has published this paper as a "working hypothesis" to stimulate further research.

H. H. S.

HETHERINGTON (Duncan Charteris). **Comparative Studies on Certain Features of Nematodes and their Significance.**—*Illinois Biol. Monog.* 1923. Apr. Vol. 8. No. 2. pp. 111–166. With 4 plates & 6 text figs. [154 refs.]

This thesis deals with some new methods of nematode technique, but chiefly with a detailed consideration of the structure of the "primitive" nematode and with a discussion on the presence and significance of ciliation among nematodes. The use of Carnoy-phenol fluid is recommended. This is composed of absolute alcohol 20 cc., chloroform 15 cc., glacial acetic acid 5 cc., phenol crystals to raise the volume by 10 cc.; totalling 50 cc. The addition of a very small quantity of water is necessary for very delicate worms. After killing, the worms are cleared in the fluid and may be stored in 80 per cent. or 95 per cent. alcohol. For sectioning, oils of synthetic wintergreen and oleum cedri ligni (Merck) or chloroform may be dropped in slowly and mixed by shaking. When the mixture is three-quarters clearing fluid the greater part is drawn off and the pure liquid added. For paraffin infiltration, wax is shaved into a dish and the whole set aside in a slightly warm place for 2 hours when the worm may be placed in pure paraffin, of 58°C., melting point, and after proper infiltration, embedded and sectioned.

R. T. L.

SENEVET (G.) & DECHAUX. **L'helminthiase intestinale infantile en Algérie. 1re enquête (Vauban, avril 1923).**—*Arch. Inst. Pasteur d'Algérie.* 1923. Dec. Vol. 1. No. 4. pp. 645–646. [1 ref.]

When examining the blood of children in the Vauban region the authors found that some of them showed a very high degree of eosinophilia, up to 55 per cent. They therefore examined the stools of 23 children between 4 and 12 years of age, 10 boys and 13 girls. Six of the former and 11 of the latter were harbouring worms. The commonest was *Ascaris lumbricoides*, present in 14, *Trichuris trichiura* next, in 6.

H. H. S.

KOSUGE (Isami). **Histologische Untersuchungen ueber das Eindringen von *Strongyloides stercoralis* in die Haut von Versuchstieren.** [Penetration of the Skin of Experimental Animals by *S. stercoralis*.]—*Arch. f. Schiffs- u. Trop.-Hyg.* 1924. Jan. Vol. 28. No. 1. pp. 15–20. With 6 figs. [6 refs.]

The author carried out experiments to determine the mode of penetration of the skin by larvae of *Strongyloides stercoralis*. He shows, by sectioning the tissues, that the same route is not always followed. In the case of a thin skin, such as that of the abdomen of a mouse, penetration is direct, but in animals with thicker skin, such as the dog, entrance is effected by the hair follicles, whence they penetrate the outer root-sheath. They then make their way into the subcutaneous tissues by perforating the sheath at the side or at the termination centrally. No larvae were found in the blood-capillaries but they were present in the lymph-vessels. He thinks that in man entrance may also occur by way of the sweat ducts.

H. H. S.

GAMINARA (Angel) & RINALDI (Mario). [**Note sur l'existence en Uruguay de cas autochtones d'anguillulose** (*Strongyloides stercoralis*, **Bavay 1876**).]—*Bol. del Consejo Nacional de Higiene.* 1923. June. Vol. 18. No. 200. p. 575. [Summarized in *Bull. Office Internat. d'Hyg. Publique.* 1923. Dec. Vol. 15. No. 12. p. 1627.]

This note shows that there are indigenous cases of infection by *Strongyloides stercoralis* in Uruguay, but so far found only in the Department of Colonia. The parasite was present in 4 3 per cent. of persons examined. All those affected were accustomed to walk about bare-foot. The general condition of the patients rapidly improved after administration of male-fern.

H. H. S.

MORISHITA (K. O. R.). **A Pig Nematode, *Gnathostoma hispidum*, Fedchenko, as a Human Parasite.**—*Ann. Trop. Med. & Parasit.* 1924. Apr. 30. Vol. 18. No. 1. pp. 23–26. [8 refs.]

MORISHITA (Kauru). **On a New Species of Gnathostoma, Causative Agent of Creeping Disease.**]—*Hifuka Hitsunyokika Zasshi* (*Jl. Dermat. & Urol.*). 1923. Oct. Vol. 23. No. 8. [Summarized in *Japan Med. World.* 1924. Feb. 15. Vol. 4. No. 2. p. 42.]

The occurrence of *Gnathostoma hispidum*, a common parasite of the pig, is here recorded for the first time as a parasite of man.

A young female specimen was found in a piece of cutaneous tissue excised in the surgical clinic of the Tokyo Imperial University. The patient from whom the parasite had been removed was a Japanese aged 43 who had lived long in Tokyo. He had felt a slight pain on the left thenar eminence and subsequently a linear swelling developed, growing from 1 cm. to about 8 cm. within three days. The case was diagnosed as having the typical clinical features of *Dermatitis linearis migrans*. A small black object was visible through the skin. This, on excision, proved to be a *Gnathostoma*.

The author adds that he has to put on record two additional cases in man of *G. spinigerum*, both from China, which will be described at a later date.

R. T. L.

ANDERSON (John) & others. **Filariasis in British Guiana (A Report of the Filariasis Commission, 1921).**—Memoir 7, Vol. 5, of the *London School of Tropical Medicine Research Memoir Series*. 1924. (Helminthological Researches in the Caribbean Area, under the Direction of R. T. LEIPER). 122 pp. With 23 plates. [2 refs.] London: Helminthological Department, London School of Tropical Medicine, 23, Endsleigh Gardens.

This Memoir constitutes the Report of the Filariasis Commission sent out to British Guiana by the London School of Tropical Medicine in 1921. It consists of seven chapters and an addendum. The first chapter deals with the geography and physiography of the Colony, together with remarks upon the population, the water supply, conservancy and vital statistics. The second treats of the clinical aspects of filariasis in British Guiana. Evidence is brought forward to show that many apparently healthy inhabitants harbour the parasite and have done so for years without exhibiting any signs to call their attention to the fact. Some accident or infection, trivial in itself, such as a scratch, a strain, a chill, may, however, serve to start the train of symptoms indicative of filariasis, notably lymphangitis, lymphadenitis and elephantiasis, less commonly chyluria, orchitis, lymphatic varix and lymph-scrotum. Many have glandular enlargements, femoral, inguinal, or both, but the first sign of attack is usually acute pain in the course of the lymphatic vessel, not at, but some distance below, the gland mass. Septic foci may develop in this lymphatic tract, giving rise to filarial abscess, or, if extending to the abdominal lymphatics, to "abdominal filariasis," in reality an acute septicaemic condition, practically always fatal. In only one of 48 patients with filarial abscess were adult filariae found, but in 41 streptococci were present, in 22 with staphylococci also, and in 5 cases the latter were alone. Reference is made to the work of Dr. MANSON-BAHR in Fiji in 1912 who found an adult filaria in only one of 23 abscesses examined.

The previous work of WISE (1910) calling attention to the important rôle played by pyogenic organisms in filarial abscess is also mentioned, in the chapter on Vaccine therapy (p. 84).

Enlarged glands were common amongst children. Of 196 examined at the Christchurch School, Georgetown, over 60 per cent. showed them, but in only 11·7 per cent. were filarial embryos found, and it was clear that causes other than filariasis were accountable for the adenitis. But allowing for this, there is doubtless a large percentage of the population suffering from glandular enlargements associated with filarial infection; the parasite, however, seemed to be harmless so long as no severe bacterial invasion occurred. Five types of elephantiasis are described, but they would appear to be grades rather than types, passing from the oedematous limb with thickening of the skin to those with irregular contour and greater hypertrophy of skin and so to the true elephantoid condition. In more than 92 per cent. of 434 patients the lower limbs only were involved, whereas chyluria was found in only 1·9 per cent. of 709 patients who visited the clinic under the auspices of the Commission.

Chapter III dealing with the pathology of the disease is a short one, but the morbid histology is well shown by the reproductions of the camera lucida drawings appended to the report. Autopsies were performed in 28 cases. Fourteen of these died of "acute septicaemia" arising from some inflammatory focus in the lymphatic system. Filarial parasites were also present, but that these played more than a preparatory rôle could not be proved. In no instance were they found to have caused complete occlusion of the lymph-channel, so that the old idea that the symptoms arose largely from occlusion, stasis and back-pressure due to a dead or aborting female filaria is shown to be erroneous, or, at all events, found no support from the investigations of the members of this Commission. On the other hand, filariasis could not be ruled out as a cause of elephantiasis. The evidence obtained made it almost certain that practically every case of elephantiasis had at one time harboured filarial parasites, that an inflammatory condition ensued, and that to this the symptoms were eventually due, whether the parasite itself survived or died. The distribution of the embryos in the different organs was not found to agree with that noted by MANSON. MANSON found that they were nearly three times as numerous in the lungs as in any other organ, but according to the present report the number in the kidney was nearly three times as great as in the lung of a patient dying during the day, and eight times as numerous in a patient dying during the night.

Chapters IV and V, giving a description of various methods of treatment adopted, are most instructive in spite of the fact that the conclusions to be drawn are largely negative in character. The former is concerned with the results of the employment of different colloidal metal preparations, mainly the standardized "Oscol" products of Messrs. Oppenheimer, Sons & Co. Oscol Argentum, Arsenium, Cuprum, Hydrargyrum, Manganesium, and Stibium, and also preparations supplied by the Wellcome Research Laboratories were tried in different cases. Tables are given showing the details as regards dosage, mode of administration, and the results of blood-examination for embryos before, during, and after treatment. The results obtained were very conflicting; the best (where none proved satisfactory) seemed to be some antimony derivative, although the effect as regards the number of embryos in the blood was practically nil. Eusol (40 cc.) and corrosive sublimate solution (3–4 cc. of a 1 per 1,000 solution) injected intravenously appeared to be of service in acute septicaemic states. A considerable number of patients, 52 in all, were treated by injections of vaccines, mostly detoxicated polyvalent streptococcal vaccines, and this line of treatment yielded on the whole better results than those obtained by the use of drugs.

Chapter VI is statistical; it has already appeared separately and is reviewed in this Bulletin (see below). The final chapter contains a summary of the findings and the general conclusions of the members of the Commission. These are of sufficient importance to warrant quotation almost in full :—

1. Practically one-fifth of the inhabitants of the colony harbour *Filaria bancrofti*, and the infection is largely urban in its distribution.

2. The intermediary host is the domestic mosquito, *Culex quinquefasciatus*.

3. There is no evidence of racial immunity to filarial infection.

4. Infestation by *Filaria bancrofti*, *per se*, produces no symptoms; all the pathological manifestations associated with filariasis are due to secondary infection by pyogenic organisms.

6. The clinical manifestations in filariasis, arising from secondary infection, can be treated with considerable effect by various antiseptic measures and by the injection of specific vaccines.

7. The only hope for total eradication of the disease from the Colony lies in prophylaxis, . . . the complete banishment of the particular mosquito from the dwellings of the people.

8. The prophylactic measures applicable to British Guiana are :—
   (*a*) The obligatory use of mosquito curtains.
   (*b*) The provision of a pipe-borne water supply . . . to replace the present system of barrels and vats. By this measure, the principal breeding-places of the domestic mosquito would be destroyed.
   (*c*) The installation of a modern system of sewage disposal.
   (*d*) A comprehensive scheme for draining the coast lands.
   (*e*) The vigorous application of ordinary anti-mosquito measures . . . and the education of all classes to the advantages of individual effort in the same direction.

An addendum to the Memoir has been contributed by Dr. G. M VEVERS ; in this is given a list of the various species of mosquitoes collected in British Guiana. It shows that the present Commission has confirmed the work of Dr. G. C. Low on *Aëdes argenteus* and filarial development (1901). Some investigations were made by Dr. Vevers to discover the intermediate host of *F. ozzardi*, but these were inconclusive.

H. H. S.

ANDERSON (J.), KHALIL (M.), LEE (C. U.) & LEIPER (R. T.). **A Filarial Survey in British Guiana, 1921.**—*Jl. Helminthology.* 1923. Dec. Vol. 1. No. 5. pp. 215–226. [6 refs.]

This paper constitutes a most valuable record of the prevalence of filariasis in British Guiana. The expedition was fortunate in having among its members one who was able to get into personal touch with East Indian immigrants, and another with the Chinese, so that facilities were present which enabled a wide range of subjects to be examined, and the results may be regarded, therefore, as authoritatively representative of the extent of infection in 1921. The subjoined Table shows that there has been a considerable increase of infection since 1896, though it must be acknowledged that none of the previous investigations have been carried out so thoroughly and extensively as this last, and that the increase has probably not been so great as would be inferred from the Table.

The figures of infection among prisoners are interesting as showing that filariasis is largely urban, for the percentage among those formerly resident in Georgetown is just three times as great as that among those from the country districts. In a compact area (Albert Town) in the heart of Georgetown blood specimens of 204 males were examined and 36·3 per cent. contained filarial embryos, while of 311 females 26·7 per cent. were positive. There was a marked preponderance of infection among the black races and among the males as compared with the females, except in the town of New Amsterdam, and here the number examined was too small to be of much statistical value as regards sex prevalence.

Finally, the question of age incidence was the subject of enquiry. Of 196 children attending the Christchurch School there was very little difference in the degree of infection amongst those between 4 and 10 years of age and those between 11 and 16 years. 515 persons were examined in Albert Town, and the highest incidence was found amongst those in the second and fourth decades, but above 20 years the percentage was fairly uniform.

GEORGETOWN AND DISTRICT.

		A. 1896	B. 1908	C. 1919–20	D. 1921
Number examined		—	—	351	2,434
		%	%	%	%
Blacks	Male	13·0	10·2	24·8	30·8
	Female	24·0	16·8	26·0	30·0
Mixed	Male	14·2	18·3	27·3	26·9
	Female	24·0	16·8	21·4	21·3
East Indians ..	Male	6·4	5·4	14·2	12·4
	Female	6·6	6·2	—	9·3
Portuguese ..	Male	16·6	16·4	15·4	23·8
	Female	25·0	24·8	16·7	21·3
Chinese	Male	—	—	—	10·0
	Female	—	—	—	4·5
Europeans ..	Male	—	—	—	9·4
	Female	—	—	—	7·7
All above	Male	10·8	9·7	19·5	22·4
	Female	20·1	17·3	23·3	19·3

A.=percentage found amongst the patients of Georgetown Hospital by CONYERS and DANIELS.

B.=corresponding infection found by WISE.

C.=percentage found by ROSE during a general survey of normal members of the population.

D.=percentage found by authors of the present paper.

H. H. S.

HAGA (J.). **Filariasis-onderzoek over dag.** [Filariasis Examination in Daytime.]—*Geneesk. Tijdschr. v. Nederl.-Indië.* 1923. Vol. 63. No. 6. pp. 864–884. [9 refs.].

Prof. KUFNEN remarked that filariae could be detected in daytime when applying a concentration method after haemolysis by means of saponine. The difficulty of obtaining saponine and the drawback that after 5–10 minutes coagulation occurs in the tubes led the author (with BARTO) to modify it. Saponine is obtained from the fruits of *Sapindus rarak,* the soap fruit which is well known to the natives of the East Indian Archipelago and is very cheap. The outer skin of the fruit is rubbed in a mortar with a little 0·9 per cent. salt solution and sterile sand, filtered, the same salt solution is then added up to 900 cc. and mixed with 100 cc. 0·3 per cent. sodium citrate. 9 cc. of this liquid in a centrifugal tube are mixed with 10-20 drops of blood. Haemolysis is complete at once and coagulation does not occur. The filariae are easily found in the sediment after centrifuging. The scattered filariae present in the blood in daytime are thus detected and research is much simplified, especially as working in native villages may be practically impossible at night. Comparison with the ordinary thick drop clearly showed the superiority of the concentration method. For preservation of the solution addition of ½ per cent. carbolic acid did not interfere with its haemolytic action; sterilization by heat proved to be less satisfactory. W. J. Bais.

SWEET (W. C.). **The Periodicity of Microfilaria Bancrofti in Brisbane.**—*Health.* Melbourne. 1924. Mar. Vol. 2. No. 2. pp. 42–46. [1 ref.]

Evidence is given to show that an examination of the blood after 9 p.m. gives reliable information concerning the presence of microfilaria. If taken between the hours of 8 p.m. and 6 a.m. the blood slides will give an accurate result for diagnosis. If taken between 7 p.m. and 7 a.m. the slides will be accurate in a considerable percentage of cases. The blood from the finger is better for the purpose than that from the ear. One patient who had been on night duty showed a re-arranged periodicity which reverted to normal on his return to day duty. The author states that *Culex quinquefasciatus* is the common carrier in Brisbane and that *Stegomyia aegypti* is not a susceptible intermediary. She is of opinion that no connexion obtains between periodicity and the biting habits of mosquitoes. Dr. CILENTO adds a note to the article suggesting that the "starter" which calls out the microfilariae before sleep is the presence of fatigue, and he demurs to the suggestion that the reversibility of periodicity may be held to demonstrate that there is no relationship between mosquito habits and filarial periodicity. R. T. L.

ROSE (F. G.). **A Rare Lesion found in Connection with Infection with** *Filaria bancrofti.*—*British Guiana Med. Annual for 1923.* p. 67.

An unusual lesion due to *Filaria bancrofti* consists of small tumours of the skin, the tissue covering them being so transparent as to give the appearance of a bullous eruption. When incised, however, they are found to be semi-solid and to contain a quantity of blood-stained serum, rather than blood, in which are to be found at any time of the day varying numbers of filarial embryos. They are, apparently, permanent, in one case at least having been present for a period of over 2 years. To the touch they are hard and do not pit on pressure. In the two cases which have come under observation these swellings were multiple, some being larger than others. In both cases they appeared on the flexor aspect of the forearm. Both cases also gave histories of continual itchings and of periodic attacks, in which the swellings become larger and reddened along with intense pain and the appearance of a red line running along the forearm. R. T. L.

ROSE (F. G.). **The Leucocytes of the Blood in Infection with *Filaria bancrofti*, with a Note on the Use of Vaccines in Filarial Condition.**—*British Guiana Med. Annual for 1923.* pp. 73–90.

A simple infection with *Filaria bancrofti* has apparently no effect on the Arneth index. When clinical symptoms occur the index almost invariably shifts to the left. This shift also occurs in filarial oedema and elephantiasis when not of long standing and bears a relation to the duration and severity of the attacks. It is well known that septic infections cause a shift to the left, and the author's investigations confirm the view that pathological symptoms in filarial infection are invariably due to pyogenic organisms.

A series of tables are given to show that the first result of the onset of an attack of filariasis is a relative increase in the polymorphonuclear cells. Favourable progress is accompanied by a relative increase in the lymphocytes. A relative increase in the neutrophiles occurs in abscess-formation and in all cases at or before the climax of the attack.

R. T. L.

DIAMANTIS. **Un cas de chylurie filarienne traité et guéri par le tartre stibié.**—*Jl. d' Urol.* Paris. 1923. Dec. Vol. 16. No. 6. pp. 471–474.

The author records the case of a man, 38 years of age, suffering from chyluria of recent onset. The urine was chylous from 10 a.m. to bedtime, clear and without albumin, pus or blood during the interval. Sodium-antimony-tartrate was injected intravenously, starting with 0·03 gm., increasing gradually to 0·13 gm., a total of 0·83 gm. being given in eight injections over a period of 17 days. After the fifth injection the urine was only slightly opalescent and became quite clear after the sixth. Ten months later there had been no return of symptoms and the patient was in good health.

H. H. S.

ASCANIO RODRIGUEZ (J. B.). **Un caso de Filariasis.**—*Rev. Med. y. Cirug.* Caracas. 1923. Oct. 31. Year 6. Month 12. No. 67. pp. 241–245. (Discussion pp. 245–247.)

A case of filariasis with a somewhat unusual history is recorded. The patient was of mixed American and Japanese parentage, was brought up in Demerara, and had lived for a short time in Trinidad before coming to Venezuela. He suffered from a left inguinal bubo, believed to be venereal in origin, which was incised. Shortly after the wound healed the patient experienced sudden pain in the right groin and flank, with shock and collapse, and "passed purulent urine containing small calculi." Filaria embryos were found in the blood.

The case formed the pretext for discussion on the question of indigenous filariasis in Venezuela.

H. H. S.

SUGANUMA (Seijiro) **[On Chemotherapy of Filariasis.]**—*Chugwai Iji Shimpo* (*Internat. Jl. Med.*). 1923. May & June. Nos. 1035 & 1038. [Summarized in *Japan Med. World.* 1923. Dec. 15. Vol. 3. No. 12. p. 275.]

Picric acid preparation was proved to have the most remarkable curative efficiency in chyluria. Although a remarkable numerical decrease of the microfilariae in the urine could be obtained by its use, total removal of the parasites could not be effected. The author considers that these observations on picric acid preparations throw light on the advance which may be made towards a successful chemotherapy for filariasis.

R. T. L.

HONDA (Ikuya). **[Ueber die pathologischen Veränderungen der Niere bei Filariasis.** The Pathological Changes in the Kidneys in Filariasis.]—*Kyoto Ig. Z.* 1921. Vol. 18. pp 28–44. [Summarized in *Japan Jl. Med. Sciences.* Tokyo. 1922. Vol. 1. No. 1. p. 65.]

The pathological changes of the kidneys in dogs affected with *Filaria immitis* are found to be very similar to those seen in man infected with *Filaria bancrofti*. According to the author, these changes are due to the microfilariae which had settled down in these organs. In experimental dogs there occurred interstitial nephritis, pseudotubercles and infarct of the kidneys. In a woman of 38, suffering from filariasis, there were seen infarcts, increase of interstitial tissues, atrophy of the glomeruli and distension of the blood and lymph vessels.

R. T. L.

BROUGHTON-ALCOCK (W.). **Case of Filaria without Clinical Symptoms : Embryos of *F. perstans* in the Blood.**—*Proc. Roy. Soc. Med.* (Sect. Trop. Dis. & Parasit.). 1924. May. Vol. 17. No. 7. p. 46.

The blood of a man who returned home at the end of 1923, after two terms of service, each of 18 months, in Northern Nigeria was examined as he was suspected to be suffering from malaria. There was an eosinophilia of 12–28 per cent. No malaria parasites were seen, but occasional embryos of *F. perstans*. Whether the eosinophilia was due to this or whether there was also a *Loa loa* infection was not determined.

H. H. S.

POUCEL (J.) & CARRIEU (M. F.). **Au sujet d'un cas de filariose nocturne** (*Filaria bancrofti*).—*Rev. Méd. et Hyg. Trop.* 1924. Feb. Vol. 16. No. 2. pp. 50–55. [22 refs.]

A soldier, aged 35 years, a native of Martinique, was sent to hospital with a diagnosis of left inguinal hernia. Except for the swelling and its site none of the usual signs of hernia were present. There was, in addition, a hydrocele on the right side. His blood contained 11 per cent. eosinophiles, so smears were made at various times between 10 p.m. and 1 a.m., and embryos of *F. bancrofti* were found. They were numerous also in the hydrocele fluid.

H. H. S.

LOW (George C.). **Unusual Varieties of Calabar Swellings, with a Note upon the Aetiology of the Condition.**—*Lancet.* 1924. Mar. 22. pp. 594–595. With 1 fig. [1 ref.]

Calabar swellings are usually localized; a rare diffuse form occurs and an example is described and illustrated in this paper, the swelling implicating the whole of the right hand and forearm. The author gives strong presumptive evidence in favour of his view that the Calabar swelling arises from the liberation of toxin following upon the death of the worm in the subcutaneous tissues and quotes a case where the worm could be felt for some time as a small inert mass in the penis following upon a transient swelling.

R. T. L.

FAIRLEY (N. Hamilton) & LISTON (W. Glen). **Studies in the Pathology of Dracontiasis. Part I.**—*Indian Jl. Med. Res.* 1924. Jan. Vol. 11. No. 3. pp. 915–932. With 2 figs. & 4 plates. [4 refs.]

In the production of the lesions of dracontiasis the adult female, the embryos and secondary bacterial invaders are all concerned. Some toxic substance is produced by the female worm which is injected by her into the tissues beneath the dermis. The local effect is to produce a blister and the absorption of the toxin accounts for the early clinical manifestations such as urticaria, cyanosis, dyspnoea, vomiting, giddiness, fainting, diarrhoea and the like.

The guineaworm embryos produce subacute sterile abscesses, but acute abscess, cellulitis, bubo and synovitis are all due to bacterial invaders. Serological investigations yielded entirely negative results, and it was found that guineaworm extracts were deficient in the particular chemical complex on which antigenic function depends. The associated tissue reactions, both macroscopical and microscopical, are described in detail. The existence of a fibrous tissue sheath surrounding the worm in the subcutaneous tissues has clinical importance.

R. T. L.

MARTINAUD (G.). **Quelques observations sur les différentes méthodes de traitement des vers de Guinée.**—*Bull. Soc. Path. Exot.* 1924. Feb. 13. Vol. 17. No. 2. pp. 146–149.

Novarsénobenzol intravenously gave very good results in two cases of guineaworm. Four cases were treated with tartar emetic which effects a very rapid and satisfactory cure. [These results confirm MACFIE ; see this *Bulletin*, Vol. 18, p. 124.]

R. T. L.

ASADA (Junichi). **[Ueber die Infektion und die Wanderung von *Ascaris lumbricoides* in Körper.** Infection with *A. lumbricoides* and its Migrations in the Body.]—*Tokyo Ij. Shsh.* 1921. pp. 161–168 ; 219–223. [Summarized in *Japan Jl. Med. Sciences.* Tokyo. 1922. Vol. 1. No. 3. p. 229.]

From extensive experiments, chiefly on mice but also on rabbits and guineapigs, the author obtained the following results :—1.—With ascaris eggs kept over 10 weeks at a temperature of 26°–32° C. only a few embryonate naturally. 2.—The ascaris eggs embryonate in culture media, *e.g.*, garden soil, and the larvae are able to penetrate the skin. 3.—Hatching takes place 1–12 hours after feeding, in the small intestine of the experimental animal. 4.—The larvae pass from the small intestine into the posterior part of the gut and within 12 hours pass through the gut wall in great numbers into the body cavity. 5.—The larvae then pierce the liver and are carried by the blood to the lungs, where they undergo further development. Thence they wander through the bronchi, trachea and larynx to the oesophagus, stomach and small intestine, where they complete their development. A small number pass through the diaphragm direct into the lungs. 6.—A small number of larvae appear to reach the liver *via* the portal system.

R. T. L.

ASADA (Junichi). **[Experimentelle Untersuchung ueber die Entwicklung und Infektionswege von *Ascaris lumbricoides*.]**—*Ni. Byor. Gak. K.* Tokyo. 1921. Vol. 11. pp. 476–477. *Tokyo Ij. Shsh.* 1921. pp. 161–168; 218–223. [Summarized in *Japan Jl. Med. Sciences.* Tokyo. 1922. Vol. 1. No. 1. p. 61.]

Contrary to YOSHIDA's view that the larvae which have passed from the digestive tract into the cavity reach the pleural cavity by penetrating the diaphragm and then enter the lung tissues as in the case of *Paragonimus westermanii*, the author has been able to show by exhaustive researches on mice, rats and guineapigs that the larvae, freed in the lumen of the gut, pass into the peritoneal cavity through the gut wall, this penetration generally occurring between the middle of the small intestine and the upper part of the large intestine, mainly, however, in the lower part of the small intestine and in the caecum. They then penetrate into the liver through its surface, and from here are carried to the lungs by the blood stream. The writer does not deny that a few of the larvae may follow the course stated by YOSHIDA. As an alternative route it was found that a certain number of larvae reach the liver, after having been freed in the intestinal tract, direct with the blood stream of the gut wall.

In addition, the author deals with the developmental stages and the period which the larvae appear in individual organs subsequent to feeding.

R. T. L.

ASADA (Junichi). **[Studies on the Abnormal Infection Route of Ascaris. I. Communication. On Per Os Infection of the Larve.]**—*Tokyo Ijishinshi* (*Tokyo Med. News*) 1923. June. Nos. 2335 & 2336. [Summarized in *Japan Med. World.* 1923. Dec. 15. Vol. 3. No. 12. p. 276.]

Ascaris larvae which had been growing in the liver and lungs of a chick had the capacity of developing further when swallowed by another animal.

R. T. L.

ASADA (Junichi) **[Resistance of the Ascaris Larvae in the Egg Shell.]**—*Tokyo Ijishinshi* (*Tokyo Med. News*). 1923. July. No. 2339. [Summarized in *Japan. Med. World.* 1923. Dec. 15. Vol. 3. No. 12. p. 277.]

Even when left for nine days in the freezing state or for one month drying at room temperature 15°C. and for seven days in 5 per cent.–10 per cent. saline solution the Ascaris larvae survive, but they die after heating for 10 minutes or more at 50°C.

R. T. L.

ASADA (Junichi) & KOHGAME (Yoshiki). **[Experimental Studies on the Resistance of the Ascarid Larvae against Physico-Chemical Stimulations.]**—*Okayama Igakkwai Zasshi* (*Jl. Okayama Med. Soc.*). 1923. Dec. No. 407. [Summarized in *Japan Med. World.* 1924. Feb. 15. Vol. 4. No. 2. p. 40.]

As a result of experimental work the author found that Ascarid larvae have a high resisting power against acids, in particular hydrochloric acid. The same holds good as regards Japanese wine, but not with sugar.

H. H. S.

TAKANO (Ryozo). **[On the Statistical Studies of Ascariasis among the City Children.]**—*Iji Shimpo* (*Med. News*). 1923. Apr. No. 1115. [Summarized in *Japan Med. World.* 1923. Nov. 15. Vol. 3. No. 11. p. 246.]

In city children of Osaka a far lower morbidity from ascariasis occurs than in country children; moreover, the incidence was higher in the older children in the city as contrasted with that in country children.

R. T. L.

TAKANO (Ryozo). **[Contribution to the Knowledge of Development of Ascaris.]**—*Osaka Igakkwai Zasshi* (*Jl. of Osaka Med. Soc.*). 1923. July. Vol. 22. No. 7. [Summarized in *Japan Med. World.* 1924. Jan. 15. Vol. 4. No. 1. p. 15.]

The average number of days taken to hatch ascaris eggs in H-ions was 14, in Ca-ions 16, in Na-ions 22·1, Mg-ions 23·3 and in Soda water 27·4 days.

R. T. L.

TAKANO (Ryoji). **[On the Albuminous Membrane of Ascaris Eggs. II. Communication.]**—*Osaka Igakkwai Zasshi* (*Jl. of Osaka Med. Soc.*). [Summarized in *Japan. Med. World.* 1923. Nov. 15. Vol. 3. No. 11. p. 250.]

The albuminous membrane of Ascaris eggs swells up in a dilution of HCl at 0·1 per cent.–4 per cent., but not in higher concentrations than 6 per cent. Lactic acid also produces a similar result. Formalin interrupts this, but not calcium chlorate or sodium chlorate nor alcoholic beverages, sugar, soy and vinegar.

R. T. L.

KOINO (Sui). **[Infection Experiments of Ascariasis in Human Body. II. Communication. On the Young Larvae expectorated in Ascarid Pneumonia.]**—*Saikingaku Zasshi* (*Jl. of Bact.*). 1923. July. No. 334. [Summarized in *Japan Med. World.* 1924. Feb. 15. Vol. 4. No. 2. pp. 46–47.]

Human beings were fed with Ascaris ova. Eight days later the larvae made their appearance, and during the succeeding eight days continued to be expectorated. The average length of these larvae was 1·746 mm. and their breadth 0·099 mm. They disappeared at the end of 16 days after the feeding with ova. The numbers found in the sputum appeared to bear a definite relation to the severity of the condition set up.

H. H. S.

KOKI (Shizukazu). **[Durch die Einwenderung von jungen Askarislarven hervorgerufene pathologische Veränderung des Gewebes. II. Mitellung.** Pathological Changes of the Tissues produced by the Invasion of Young Ascaris Larvae.]—*Tokyo Ij. Shsh.* 1921. pp. 2298 2302. [Summarized in *Japan Jl. Med. Sciences.* Tokyo. 1922. Vol. 1. No. 1. pp. 63–64.]

The blood changes in artificial infections with young ascarid larvae were studied in rabbits. The writer was able to show an eosinophilia increasing parallel with the degree of infection.

R. T. L.

OKUJIMA (AIJIRO). **[Ein Fall von durch Einwanderung von Ascaris hervorgerufenem Empyema pleurae.** A Case of Empyema produced by Migration of Ascaris.]—*Fukuoka Ikw. Daig. Z.* 1921. Vol. 14. pp. 1-6. [Summarized in *Japan Jl. Med. Sciences.* Tokyo. 1922. Vol. 1. No. 1. p. 64.]

The author in an operation for left thoracic empyema found a dead male Ascaris in the pleural cavity. As pus and bile passed into the pleural cavity after the operation and from chemical examination of the colouring matter adhering to the parasite, the author concludes that the ascaris passed from the original abscess in the peritoneal cavity (perhaps the liver) through the diaphragm into the pleural cavity.

R. T. L.

MATSUBARA (Kinichi). **[On the Changes in the Lungs in Experimental Ascariasis in the Homogeneous Animal (A Preliminary Report).]**—*Tokyo Iji-Shinshi* (*Tokyo Med. News*). 1923. Feb. No. 2315. [Summarized in *Japan Med. World.* 1923. Oct. 15. Vol. 3. Nos. 9 & 10. p. 224.]

The following points are specific for ascariasis pneumonia, which can be distinguished from ordinary bronchial pneumonia :—" presence of the larvae of ascaris in the sputum ; mostly prone to have haemorrhage ; no edematous changes discernible around the foci ; the exudates occurring in the alveoli and the bronchus do not show any sign of necrosis ; . . . . ascariasis pneumonia rather shows the features belonging to desquamative pneumonia."

R. T. L.

YOSHIDA (Sadawo). **[On Some Studies on Ascaris.]**—*Osaka Igakkwai Zasshi* (*Jl. Osaka Med. Soc.*). [Summarized in *Japan Med. World.* 1923. Nov. 15. Vol. 3. No. 11. p. 250.]

The eggs of Ascaris die immediately in 50 per cent. solutions of hydrochloric acid, sulphuric acid, glacial acetic acid, nitric acid and formalin. They live and develop in 5 per cent. solution of common salt, but die within several weeks in 25 per cent. or 20 per cent. Caustic solution kills them in several days, although they may live even for 2-3 weeks in 40 per cent.-45 per cent. solutions and for longer in lower concentrations. Boiling water kills them instantly. In formalin 15 per cent.-25 per cent. the embryonated eggs may live for a week and for the same period in 0·5 per cent.-1 per cent. carbonic acid solution. In lysol they die in 5 days in 1 per cent., 7 days in 5 per cent. and 3 days in 10 per cent. Sudan III is the best means of determining by staining technique if the eggs are alive or dead.

R. T. L.

MOTTA (L. Cunha). **Ascariasis of Intrahepatic Bile Ducts with Calculus Formation, Dilatation of Ducts, and Chronic Cholangeitis.**—*Jl. Amer. Med. Assoc.* 1924. Jan. 12. Vol. 82. No. 2. pp. 85-87. With 4 figs. [12 refs.]

This is a record of another case of Ascaris in a bile duct in the liver. There was marked dilatation of the duct, with surrounding fibrosis, and the parasite was an adult. In other ducts there were friable calculi of varied size, brownish-yellow in colour, which the author thinks probably resulted from worms which had died and become disintegrated. A brief summary of the literature relative to previously recorded cases is given.

H. H. S.

ENGEL (Rudolf). **Beitrag zur Askaridenerkrankung der grossen Drüsenorgane in der Bauchhöhle.** [Ascarid Infestation of the Large Abdominal Viscera.]—*Muench. Med. Woch.* 1924. Mar. 28. Vol. 71. No. 13. pp. 403-404.

A man, 46 years of age, shortly after a meal was seized with acute abdominal pain which became localized to the epigastrium. Ten days later he was sent to hospital. He was obviously very ill, with the signs of acute peritonitis. The stomach was washed out and two ascarides, each 30 cm. in length, were evacuated, a third being vomited a few hours later. The general condition becoming worse laparotomy was performed. There were signs of peritonitis and fat-necrosis of the transverse mesocolon. Behind the gall-bladder was an abscess which was opened accidentally by the exploring finger, and the tail of the pancreas was hard and swollen.

The patient bore the operation badly and died 14 hours afterwards. At the autopsy an ascaris, 15 cm. in length, was found in a bile duct in the centre of the liver, another in the ductus choledochus, and two very large ones free in the duodenum. Between the liver and pancreas was a large abscess which had made its exit towards the head of the latter, setting up the fatal peritonitis. The changes in the liver due to the presence of the ascaris were very slight and there were no signs of pus in that organ.

H. H. S.

WATKINS (Thomas H.) & MOSS (Olin W.). **Report of Two Cases of Intestinal Obstruction caused by Roundworms following Dosage of Santonin.**—*Jl. Amer. Med. Assoc.* 1924. May 3. Vol. 82. No. 18. pp. 1442–1443.

A peculiar coincidence is here related in which two children belonging to the same family exhibited within a fortnight closely similar symptoms. Their ages were 3 and 4½ years respectively, and they were suspected of harbouring Ascaris. Without any preliminary treatment, dietetic or otherwise, santonin was given, 3 gr. to the younger, 4 gr. to the elder, followed by a purgative of calomel. Each passed one worm, but vomiting and pain continued and a mass was felt in the abdomen. Operation showed this to be due to Ascarides; 49 were removed from the first, 53 from the second.

H. H. S.

ROBERTSON (M. O.). **Surgical Conditions caused by Intestinal Parasites: Report of Two Cases.**—*Jl. Amer. Med. Assoc.* 1924. Mar. 1. Vol. 82. No. 9. p. 717. [3 refs.]

The first of these cases was a man of 20 years with symptoms of perforating appendicitis. At the operation three small perforations were found in the lower ileum and three specimens of *Ascaris lumbricoides* were extracted through the perforations. The second was a Japanese child, 2 years and 3 months old, operated upon for a perforated appendix. This was removed and the following morning an Ascaris was found under the dressing. Both patients made an uneventful recovery.

H. H. S.

COOK (Archibald S.). & TASKER (D. G. C.). **Discharge of** ***Ascaris lumbricoides*** **through Appendicitis Scar.** [Memoranda].—*Brit. Med. Jl.* 1924. Apr. 12. pp. 664–665. [1 ref.]

A girl, aged 12 years, was operated upon for peritonitis resulting from perforating appendicitis. Four weeks later the child left hospital with the wound nearly healed. A serous discharge continued, however, associated with itching in the wound, and three months later three adult and two small *Ascaris lumbricoides* made their way through the lower part of the scar where the tube had been. Two days later a dead adult female ascaris was passed, per rectum, santonin having been given when the first worm appeared. The wound then healed. The parasites had not caused the perforation, for the peritoneum was very carefully mopped free of exudate at the operation and they would have been seen. They had probably been living in the small intestine without causing any symptoms and later passed down and made their way out through the appendical stump.

H. H. S.

GALLIE (W. E.) & BROWN (Alan). **Acute Hemorrhagic Pancreatitis resulting from Roundworms. Report of Case.**—*Amer. Jl. Dis. of Children.* 1924. Feb. Vol. 27. No. 2. pp. 192–194. [2 refs.]

Acute haemorrhagic pancreatitis is a rare condition in children. A case is here described in which the cause was probably the entrance of an Ascaris into the ampulla of Vater. A child, 2½ years of age, was suddenly seized with acute abdominal pain and vomiting. These symptoms continued for 9 hours, and then as suddenly ceased. The only physical sign detected was a swelling about 3½ inches long by 1 inch broad running transversely across the abdomen just below the level of the pylorus. Except for the fact of the narrowness of the swelling and its fixity it resembled an intussusception. At operation, forty hours after the onset of symptoms, the tumour was found to be the pancreas covered by acutely inflamed omentum. The mass was studded with small patches of fat-necrosis. Fifteen hours afterwards a full-sized Ascaris was extracted through the mouth. Recovery was uneventful. Though the worm was not seen at the operation and subsequent treatment failed to demonstrate any others, the authors believe that the pancreatitis was due to the worm obstructing the ampulla and that the sudden cessation of the pain and vomiting indicated the withdrawal of the parasite.

H. H. S.

KORTZEBORN (A.). **Ein Spulwurm in der freien Bauchhöhle als Todesursache nach einer Magenresektion.** [Death after Resection of Stomach caused by an Ascaris in the Peritoneal Cavity.]—*Muench. Med. Woch.* 1924. Apr. 11. Vol. 71. No. 15. pp. 473-474. [11 refs.]

COLMERS has recorded a case in which, ten days after operation for gastric carcinoma, a fistula developed by which, four days later, an Ascaris emerged, which otherwise would probably have perforated into the abdominal cavity and set up a fatal peritonitis. The author gives details of a somewhat similar case. The patient, a woman 56 years of age, was operated upon for " hour-glass " stomach associated with gastric ulcer; death occurred six days later from peritonitis. At the autopsy the site of the operation appeared healthy and the peritonitis was ascribed to the presence of a living ascaris in the abdominal cavity. The author states that the abdomen was carefully explored at the operation and concludes that the worm probably made its way from the stomach shortly after the operation, and before the wound in the viscus became sealed. He mentions that in the Pathological Institute at Strassburg, there is a preparation showing this migration actually taking place, and points the moral that before abdominal operations faecal examinations should be carried out, and, if time allows, the patient be first treated for the helminthic infection.

H. H. S.

THORNTON (H.). **The Relationship between the Ascarids of Man, Pig and Chimpanzee.**—*Ann. Trop. Med. & Parasit.* 1924. Apr. 30. Vol. 18. No. 1. pp. 99–100. With 2 figs. [1 ref.]

A comparison of *Ascaris lumbricoides* from Man, Pig and Chimpanzee by the author leads him to confirm the findings of previous workers that morphologically these forms cannot be distinguished.

R. T. L.

WUNDT (Nora). **Ueber Möglichkeit der intraintestinalen Entwicklung von Oxyuren unter Umgehung der Magenpassage.** [The Possibility of Intra-Intestinal Development of Oxyuris without Traversing the Stomach.]—*Muench. Med. Woch.* 1924. Apr. 25. Vol. 71. No. 17. pp. 546–548. [23 refs.]

This is an interesting paper describing experimental work carried out to test the possibility, or rather the likelihood, of Oxyuris developing directly in the body. The material was obtained from the interior of excised vermiform appendices. Fifty such were examined and in twelve of them Oxyuris was found. GOEBEL'S findings (1921) are quoted and in the main were confirmed, but the author concludes that the small intestine is not a favourable site for development of the ova. The appendix is shown to be a hiding place for the parasite and not the place of growth. Attempts at artificial development in the incubator of eggs obtained from the appendix proved unsuccessful. Eggs proved very resistant to drying and were alive after being kept for weeks in the air, though they were killed in 24 hours or so at 37°C. She was unable to develop those with granular contents under any experimental conditions, but if those with embryos were placed in gastric juice of average acidity and normal saline the embryos escaped, whereas they were killed when placed in fluid from the duodenum, small intestine, or appendix. It is highly improbable, therefore, that Oxyuris can develop within the intestine without the eggs passing out and entering again by the mouth. [In this point the author differs from GOEBEL, who reported that he had succeeded in obtaining development of ova deposited in the intestine to mature worms in the lowest part of the small intestine and in the appendix.]

H. H. S.

SANDGROUND (J. H.). "*Oxyuris Incognita*" or *Heterodera radicicola?*—*Jl. Parasit.* 1923. Dec. Vol. 10. No. 2. pp. 92–94. With 4 text figs. [4 refs.]

Curious ova, having a general outline suggestive of the bean-shaped eggs of the genus Oxyuris, have been noted in the human stool by KOFOID and WHITE, and others (see this *Bulletin*, Vol. 17, p. 87). The author has now identified them as ova of *Heterodera radicicola*, a common root-parasitic nematode of radishes, celery, carrots, turnips and potatoes. By feeding experiments he has shown that eggs indistinguishable from the "*Oxyuris incognita*" ova appear in human stools after the ingestion of parasitized roots.

R. T. L.

LANE (Clayton). **The Mass Diagnosis of Ankylostome Infestation. (Parts II to VII.)**—*Trans. Roy. Soc. Trop. Med. & Hyg.* 1923. Dec. 13 & 1924. Jan. 17. Vol. 17. Nos. 6 & 7. pp. 407–436. With 4 figs. [19 refs.]

The present paper is a continuation of that which appeared in the *Transactions of the Royal Society of Tropical Medicine and Hygiene*, Vol. xvi. No. 6 (this *Bulletin*, Vol. 20, p. 947). A large number of points are dealt with, many of them in great detail, and only the most important can be mentioned in a review such as this. The first section (Part II) describes the technique of the author's simplified Direct Centrifugal Floatation (D.C.F.) method of concentrating hookworm ova. For obtaining a uniform quantity of faeces a special cylindrical tube is used and pressed into the faeces till it is filled. Water is added to within an inch of the top of the centrifuge tube and the faecal mass disintegrated. A second important point is the rate and time of centrifuging of this emulsion, namely, 1,000 revolutions per minute for one minute. Thirdly, the deposit is to be evenly suspended in saturated salt solution, specific gravity 1,200. The primary emulsion should not be made of this because of bubble formation and the rising of lumps if the stool be fatty. The remainder of the procedure is as previously described. In Part III it is shown that for accurate counting the film must not be either too deep or too dense. If not sufficiently shallow the ova will not be in one optical layer and enumeration will in consequence be difficult; if too dense some ova will escape recognition. The remainder of this section is occupied by a consideration of previous methods of control devised by the author and by STOLL, all of which are shown to be faulty. A new method, denominated Control E, as checked by Direct Centrifugal Floatation, has proved more accurate. diminishing the adhesiveness which is an important element in lessening the value of the previous control methods.

Part IV treats of the question of examination of preserved stools, since the counts must be inaccurate if either hatching of larvae or death of ova and consequent disintegration take place before the specimen reaches the laboratory. The effect of temperature is marked; thus, a specimen in water kept on ice and at 22°C. for 7 days showed ova all of normal appearance, whereas at 41°C. all were degenerate. This matter is again referred to in Part VI where it is shown that the best results (*i.e.*, the least change) are obtained by the use of thymolized water on ice. The specimen of faeces is disintegrated in the original tube which is nearly filled with water to which one drop of a 10 per cent. solution of thymol in spirit is added. In Part V. a consideration of the relation between the ovum content of the stool and the hookworm content of the bowel is taken up. BAERMANN'S "cultivation method" is shown to be very erroneous; STOLL'S estimate of 44 ova per cc. of solid stool per female is stated to be nearer the mark, though the ratio is still undetermined. Part VI. is a disquisition on the accuracy and consequent reliability of the author's method. With fresh stools the first centrifuging gives an average of 76 per cent. of the total ova, the second 18, the third 2, the fourth 1, and the pour-off 3 per cent. With preserved stools those kept in thymolized water and on ice yielded 72 per cent. at the first centrifugation, those kept in plain water 70 per cent. The D.C.F. method, it is claimed, will detect with certainty in 1 cc. of stool in suspension, kept for a week at a temperature below 30°C., the ova from a single normally ovipositing ankylostome. Lastly, it is demonstrated that reducing the area of examination by "discing" (that is, allowing the hanging-drop on the coverslip supported by the small masses of plasticine to touch the slide, or by running from a pipette the concentrated salt solution between the two till a disc of 10 mm. diameter was produced) did not proportionately reduce the time required for microscopic examination, and that the advantages did not seem to outweigh the disadvantages.

H. H. S.

FÜLLEBORN (Fr.). **Ueber " Taxis " (Tropismus) bei Strongyloides-und Ankylostomenlarven. (Vorläufige Mitteilung.)** [Tropisms of Strongyloides & Ancylostome Larvae.]—*Arch. f. Schiffs- u. Trop.-Hyg.* 1924. Apr. Vol. 28. No. 4. pp. 144–165. With 5 figs. [12 refs.]

By the term "Tropism" or "Taxis" the author intends "the movements of an animal in a definite direction due to the action of a directing stimulus" (richtungsgebender Reiz). His experiments were carried out mainly on larvae of *Strongyloides stercoralis* and *Ancylostoma caninum*, and occasionally on those of free-living nematodes. Several forms of this taxis are dealt with in detail, some of which have received briefer mention in previous papers. *Thigmotaxis*, or thigmotropism, may, perhaps, be defined as the stimulus of contact. This is not the same as the power of penetration exhibited, *e.g.*, in skin-penetration. The collection of the larvae at the circumference of a drop of water is interpreted as thigmotaxis set up by the resistance of the surface tension.

Positive Oxygen- and Negative Carbon dioxide taxis.—By the use of an ingenious apparatus it is shown that the oxygen of the air exercises a power of attraction on Strongyloides larvae in water, while the admission of CO_2 produces a repelling action, or at least leads to their withdrawal. Chemotaxis of other kinds are just mentioned, but this the author has not yet determined. *Tonotaxis* may possibly play a part in the penetration of tissues by larvae, as, for example, the passage of ascaris through the intestinal wall.

Hydrotaxis.—Since Ancylostoma and Strongyloides are not very resistent to drying it is probable that there is some such stimulus to seek moisture, but nothing is known at present in this regard. From experiments devised to prove or disprove hydrotropism, though this could not be definitely excluded, on the other hand the positive was not proved. The same applies to Barytaxis (or Geotropism), Phototaxis and Electrotaxis.

Thermotaxis, as already described by KHALIL, was noted by Professor Fülleborn in the case of Ancylostome, Necator, Strongyloides, and other larvae, but not with free-living larvae. KHALIL found that larvae at the periphery of a drop of water were not attracted by the source of heat. This, the author explains, is due to thigmotropism from the surface layer of the fluid, and he shows experimentally that the latter can be overcome by the former.

Rheotaxis—the direction taken by bodies when placed in a current of fluid flowing through a narrow tube—is a negative one with filariform strongyloides larvae and with ancylostome larvae and also, apparently, with the corresponding stages of free-living nematodes; that is, their anterior extremities point away from the direction of flow and they, as it were, swim against the current.

The whole paper is of great interest, and details are given of the experiments devised to test the points referred to, but it is, unfortunately, impossible to describe these in a brief review, and all concerned in helminthological work would reap advantage by studying the original.

H. H. S.

DE LANGEN (C. D.). **Prenatal Infection by Ankylostoma.**—*Meded. Burgerlijk. Geneesk. Dienst in Nederl.-Indië.* 1923. Part 3. pp. 275–277.

The author found three ankylostome ova in examining two smears of the faeces of an infant 6 days old. Two other medical men in Batavia found ova, one in a new-born child's second motion, and the other on the seventh day after birth. The only possible explanation except prenatal infection is that, owing to unclean habits on the part of the mother, ova may have been introduced into the mouth and have passed through the alimentary canal unchanged.

H. H. S.

McBRAYER (R.). **The Basal Metabolic Rate in Uncinariasis.**—*Southern Med. Jl.* 1923. Dec. Vol. 16. No. 12. pp. 922–923.

The basal metabolic rates were determined in six cases of hookworm infection; four had also incipient tuberculosis. Five of the six had an abnormal rate and four, whose cases were followed, slowly reached normal after thorough treatment for the hookworms. Several weeks passed before the normal was attained. All had a moderate degree of anaemia—red cells 3,460,000 to 4,960,000 and haemoglobin 65 to 85 per cent.—but there was no apparent relationship between the anaemia and the metabolic rates.

H. H. S.

CILENTO (R. W.). **Some Problems in Hookworm Disease at the State Orphanage, Townsville.**—*Med. Jl. Australia.* 1923. Oct. 20. 10th Year. Vol. 2. No. 16. pp. 403–408. With 1 sketch map. [7 refs.]

This paper is a report on the conditions responsible for hookworm disease at the State Orphanage, Townsville, Queensland. In the locality of Townsville the incidence of hookworm is less than 2 per cent., whereas in 72 inmates of the orphanage 50 per cent. were positive. *Trichuris* occurred in 22·2 per cent. and *Hymenolepis nana* in 5·6 per cent. Of 47 children who had been "fostered out" 53·3 per cent. were infected with hookworm, showing that they tend to retain the infection they acquire in the orphanage. It was ascertained that there was a heavy soil infestation in certain areas frequented by the children both at work and play. The measures, based upon our present knowledge of the disease, necessary to meet the particular conditions obtaining in the orphanage are related in detail.

R. T. L.

DE NOOY (J. A.). **Investigations as to the Presence of Ankylostoma Larvae in the Soil of the Native Villages at Batavia.**—*Meded. Burgerlijk. Geneesk. Dienst in Nederl.-Indië.* 1922. Pt. 3. pp. 125–134. [3 refs.]

For the purposes of this investigation the author took from each site to be tested ten tins each with a capacity of 600 cc. The soil was placed in sieves and these in wide funnels filled with water and fitted with a rubber tube and clip at the exit. The larvae were found to pass into the water which was then drawn off and examined. By addition of 7 per cent. caustic potash solution sheathless and free-living larvae were killed, the sheathed not being affected. Those kampongs (native villages) with a stream flowing through had a soil practically negative, because the stream was used as a public latrine. In "dry kampongs," *i.e.*, those having no such stream, the soil in the neighbourhood of 20–25 per cent. of the latrines was infected.

Being struck by the enormous number of fly-larvae in the latrines the author took the opportunity of investigating whether flies might not play a part in the dissemination of ancylostomiasis. By an ingenious experiment he found that in 20 hours ten flies had carried—on their bodies and limbs, not passed through their intestines—400 larvae from a culture of *A. caninum.* Analogous results, though the numbers carried were less, were obtained with *A. duodenale.* Again, flies were seen to deposit eggs on a culture of hookworm larvae. The maggots hatched out and wandered on to the table and were found also to be carrying larvae. Both adult and larval flies can, therefore, aid in the dissemination of ancylostomes.

The author contradicts Looss's statement that "mature ankylostome larvae cannot withstand desiccation even for the space of a second; indeed they always die before they become completely dry." A flake of culture of larvae was taken up in a platinum loop and exposed to the glaring sun for an hour and a half. The shrivelled larvae recovered their normal movements after transference to water. Further, larvae of A. *caninum* were placed on a slide and dried for 24 hours in an incubator at 37°C., but revived again in water. Half of the larvae from a human case revived after drying for 20 hours at 37°C. The question as to whether revived larvae are capable of causing infection was not determined.

Lastly, a suspension of larvae of *A. caninum* was accidentally spilled on the laboratory table; irritation and redness of the skin of one of the workers indicated penetration, but ova did not subsequently appear in the faeces. This, therefore, constitutes a negative contribution to the solution of the question as to the infectibility of man by *A. caninum.*

H. H. S.

MHASKAR (K. S.). **Hookworm Infection in the Soil.**—*Indian Jl. Med. Res.* 1924. Jan. Vol. 11. No. 3. pp. 951-960. [8 refs.]

The Trichinopoly Municipality has a trenching ground extending over 260 acres of waste land for the disposal of night soil. It is divided into three blocks, each of which receives human excrement for one year. The trenches are 18 ins. deep, 30 ins. wide and are 12 feet apart. The night soil is spread out to a depth of 9 ins. and is covered with 9 ins. to 12 ins. of fairly broken earth. They are fully exposed to sun and rain. Very little vegetation is allowed to grow. After three years the trenches are dug up and sold as agricultural manure. From this area the author collected 288 samples so as to correspond to practically every day of the year. The results of his investigation are tabulated, and the conclusions drawn are:—The longest period that hookworm larvae live in night soil is 14 weeks. They diminish rapidly from day to day, especially after the 8th week. The larvae are found only in soil that has been directly contaminated with faecal matter. The "unsheathing" of hookworm larvae is a normal occurrence. Nightsoil can be safely used as manure after a period of 6 months. Deep trenching offers no advantages in the elimination of the infections and has the disadvantage of keeping the night soil in a fluid state. In Trichinopoly hookworm incidence is low although there is daily indiscriminate soil infection, for infection is localized to places where faecal matter is actually deposited.

R. T. L.

TSUTSUI (Koichiro). **Experiments on the Resisting Power of the Hookworm Egg and Larva against Heat.**—*Taiwan Igakkai Zasshi* (*Jl. Med. Assoc. Formosa*). 1924. Mar. No. 233. p. 6.

55°C. was the highest temperature to which hookworm ova could be submitted for a positive culture of larvae to be obtained afterwards. The results of culture of ova which had been raised to 57°C. was always negative.

Encysted hookworm larvae were placed in tubes standing in hot water at temperatures ranging from 45°C. to 65°C. The larvae were always found dead after submission to 55°C. These tests shew that hookworm eggs and larvae contained in faeces can be destroyed if the temperature is raised to 57°C. or more.

R. T. L.

THIROUX (A.). **Sur un procédé destiné à empêcher l'infestation du sol par les larves d'ankylostomes dans les pays chauds.**—*Bull. Soc. Path. Exot.* 1924. Apr. 9. Vol. 17. No. 4. pp. 303–306. [5 refs.]

As the temperature of fermenting horse-manure will destroy fly larvae it is suggested that hookworm larvae may be killed in a similar manner. M. ROUBAUD, who spoke on the question, pointed out that the practical application was less simple than the theory.

H. H. S.

FÜLLEBORN (Friedrich). **Bemerkungen ueber die Identifikation von "Hakenwürmern."**—*Arch. f. Schiffs- u. Trop.-Hyg.* 1924. Jan. Vol. 28. No. 1. pp. 12–15. With 6 text figs. [2 refs.]

RILEY and FITCH recorded that *Uncinaria polaris* and *U. stenocephala* were identical and that *U. criniformis* had not been found in dogs or cats. Professor Fülleborn found a hookworm in an East African dog and infected other dogs with the material from this and obtained from the intestine of one of them a nematode, the males of which measured 5-7·5 mm. He makes use of these to illustrate the first of the statements above and to controvert the second. According to the position of the parasite the appearances under the microscope are shown to be those represented by LOOSS in one place as *U. criniformis* and in another as *U. polaris.* He agrees that the last-named is not a valid species, but does not discuss the question of nomenclature as to whether this specimen should be named *U. criniformis* or *U. stenocephala.* He writes this paper to show how different the appearance of a worm may be according to its position on the slide. A plate of 6 figures well reproduced illustrates the points advanced.

H. H. S.

TONINA (T. A.). **[Hookworm in Argentina.]**—*Semana Medica.* Buenos Aires. 1923. Aug. 2. Vol. 2. p. 191. [Summarized in *Jl. Amer. Med. Assoc.* 1923. Dec. 22. Vol. 81. No. 25. p. 2154.]

Hookworm is stated to be common in a large part of Argentina, but in children infection may lie latent and only gives rise to symptoms as early adult life is reached. At the Buenos Aires Children's Hospital only 36 cases have been under treatment in 15 years.

An extract of hookworms is employed for testing, analogous to the Schick reaction in diphtheria.

H. H. S.

ROSS (G. A. Park). **Hookworm Infection and Disease (Ankylostomiasis) in Natal and Zululand.**—*Med. Jl. S. Africa.* 1924. Mar. Vol. 19. No. 8. pp. 238–241.

This brief paper is an extract from a report by the author to the Native Affairs Department, Natal, in 1910, and is of historical interest only. As a result of investigations carried out in that year it was concluded that ankylostomiasis was rare and unimportant among the Zulu population and was practically confined to the coast flat. It is said to be non-existent in Natal at the present day.

H. H. S.

FISCHOEDER (Edward). **Badania serologiczne nad choroba tegoryjcowa. Serologische Untersuchungen bei Anchylostomiasis.**—*Medycyna Doswiadczalna i Spoleczna.* Warsaw. 1923. Vol. 1. No. 5–6–7. pp. 338–344. German Summary p. 243. [6 refs.]

With the idea that the anaemia associated with hookworm infection was the result of repeated anaphylactic shocks due to absorption of albuminous toxins produced by the parasite, the author attempted to evolve a precipitin reaction between the serum of a patient and a saline extract of adult and embryo *Ancylostoma.* Though he was unable to obtain any such reaction with the patient's serum he succeeded in so immunizing a rabbit with embryos that a definite precipitating serum was produced in that animal.

H. H. S.

KAI (Toshiwo). [**On the Resistance of the Erythrocytes against Hypotonic Solution and Saponin Solution as well as Blood Findings in Ankylostomiasis.**]—*Fukuoka Ikadaigaku Zasshi* (*Jl. Fukuoka Med. College*). 1923. Mar. Vol. 16. No. 2. [Summarized in *Japan Med. World.* 1923. Nov. 15. Vol. 3. No. 11. p. 244.]

In ascariasis the erythrocytes have a wider [higher ?] range of resistance against hypotonic saline but a lower resistance against saponin. After complete vermicidal treatment the resistance became normal. These phenomena paralleled those found in anaemia. Latent haemorrhage was positive in the faeces before and negative after treatment. In 27 per cent. of the author's cases there were retinal haemorrhages, while in the 1st Department of the Internal Medicine of the Kyushu Imperial University retinal haemorrhages occurred in about 31 per cent.

R. T. L.

HOSONE (Sanzo). [**On Ankylolysin.**]—*Nihon Biseibutsugaku Zasshi* (*Jl. Japan Microbiol. Soc.*). 1923. Feb. Vol. 17. No. 2. [Summarized in *Japan Med. World.* 1923. Dec. 15. Vol. 3. No. 12. p. 272.]

The author has demonstrated a haemolysin named " Ankylolysin " in the body of ankylostomum which " has the power to liberate the host's blood corpuscles which had been sucked up into the stomach."

R. T. L.

GIGLIOLI (G.). **Ankylostome Inspection in Mackenzie, Rio Demerara. (Report on Carbon Tetrachloride in the Treatment of Hook Worm.)**—*British Guiana Med. Annual for 1923.* pp. 151–173.

At Mackenzie City—a bush settlement of the Buaxite Co., in British Guiana—the employees have been examined for hookworm. Ankylostomiasis is practically non-existent, for there is a careful examination for anaemia prior to engagement. The incidence of hookworm as an infection is, however, high—approximating 80 per cent. The author has had opportunity of testing the efficacy of various anthelminthics. He finds carbon tetrachloride " by far the most effective and practical drug for the treatment of ankylostomiasis." It is not unpleasant to take, it in no way interferes with the patient's usual work, it is a stable chemical product, of easy posology, and is much cheaper than any other drug. A great deal could be done by a properly directed systematic and general mass treatment system in a country like British Guiana, and the author illustrates in an appended note the truth of his contention by giving details of his experience in treating 800 persons from Mackenzie City and Akyme on these general lines. Tabular statements show the condition of the faeces after the mass treatment.

R. T. L.

SAWYER (W. A.) & SWEET (W. C.). **A Comparison of Certain Methods of Treatment and Diagnosis of Hookworm Infection.**—*Arch. Intern. Med.* 1924. Jan. 15. Vol. 33. No. 1. pp. 35–46. With 2 figs. [5 refs.]

An examination of the inmates of the Hospital for the Insane at Sandy Gallop, on the outskirts of Ipswich, in Queensland, showed 27·1 per cent. to be infected with hookworm. The infection was light and in most cases had been contracted before transfer from the hospital at Goodna, upon which the authors have already reported (see this *Bulletin*, Vol. 21, p. 225). From comparative studies made on 119 infected persons the authors conclude that in doses regarded as sufficiently safe carbon tetrachloride is not as efficient (for use on a large scale in the field) as chenopodium in dealing with *A. duodenale.* Oil of chenopodium in a 1·5 cc. dose given in two equal parts at an interval of 2 hours followed by a purge was highly efficient and superior to the dose undivided. Willis' salt-flotation technique is a simple and efficient test for the presence of infection. Although carbon tetrachloride is a mild laxative, it cannot be depended upon in moderate doses or mixed with chenopodium to move the bowels. A purge three or four hours after administration is advisable. The selective action of carbon tetrachloride on the female worms is insignificant. The usual series of charts and statistics shewing relative efficacies and percentages of worms discharged illustrate the text.

R. T. L.

FIELD (F. E.). **Carbon Tetrachloride in the Treatment of Human Ankylostome Infection.**—*British Guiana Med. Annual for 1923.* pp. 174–181.

Using 4 cc. of carbon tetrachloride as the dose for adult males the author agrees with NICHOLLS and HAMPTON that this drug is the best vermifuge for ankylostome infection. In nearly all the cases there was giddiness, nausea and burning in the stomach and in a few rather severe vomiting after administration of the drug, but there were no symptoms 12 hours later. The vast majority of the worms were passed on the first day. The author assesses his percentage of cures at 80 per cent. after one treatment and the remainder after a second treatment.

Carbon tetrachloride is safe if given in small doses. It is quite unnecessary to give adults more than 3 cc. The drug was used in the case of a very anaemic and ill pregnant woman and she delivered a premature child 4 days after treatment. The author regards it as doubtful whether the drug induced labour, but he recommends chenopodium with castor oil as safe in these cases.

R. T. L.

BAIS (W. J.). **Over de beteekenis van Tetrachloorkoolstof voor de bestrijding der mijnwormziekte in het groot, en over de giftigheid van dit middel.** [On the Significance of Carbon Tetrachloride for combating Hookworm Disease on a Large Scale and on the Toxicity of this Drug.]—*Geneesk. Tijdschr. v. Nederl.-Indië.* 1924. Vol. 64. No. 1. pp. 151–178. With 2 graphs in text. [30 refs.]

After a hookworm campaign of 10 years' duration in an indentured Javanese labour force on tea estates of Sumatra, carried out in the first place by mass treatment with chenopodium oil, the author found hookworm disease to be still prevalent among the coolies (average wormcount in apparently healthy coolies, 138). He ascribes this (1) to the interference of filling of the stomach with the results of the chenopodium cure when administered on the estates, (2) to the fact that chenopodium oil is less effective in the lighter degrees of infection. The action of carbon tetrachloride is not at all or much less subject to these drawbacks. After the introduction of carbon tetrachloride as a routine cure (2–3 mass treatments in 1½ years) the wormcount in the labourers decreased to 13, whilst the general state of health (admission rate for hookworm disease, general sickness rate, average haemoglobin percentage) improved considerably as shown in a graph.

There occurred, however, 3 cases of fatal intoxication with the drug (3 cc.), which are quoted. The literature on the toxicity of carbon tetrachloride is reviewed and the author ultimately advocates a lower dosage for the routine treatment.

W. J. Bais.

CADBURY (Wm. W.). **Carbon Tetrachloride in the Treatment of Uncinariasis.**—*Amer. Jl. Trop. Med.* 1924. Jan. Vol. 4. No. 1. pp. 13–21. [11 refs.]

An investigation was carried out at the Canton Christian College with the twofold purpose of determining the prevalence of hookworm infection amongst the workmen and of comparing the efficacy of treatment by chenopodium oil with that by carbon tetrachloride.

Of 172 men examined 119, or 69 per cent., were positive. These were divided into small groups, some being treated with the former drug, others by the latter. The oil of chenopodium was given in three doses, each of 1 cc., in capsules, at hourly intervals in the early morning and was followed in three hours by an ounce of castor oil. The carbon tetrachloride was given in doses of 3–6 cc. in 20 cc. of water. At first a preliminary saline purge was administered, but this was not found necessary, and in a few instances only, where no evacuation occurred, was castor oil given subsequently. Thirty-one were treated once with oil of chenopodium, and of these 18 were cured, whereas of 36 treated with one dose of carbon tetrachloride 13 were cured. The statement of HAMPTON and others that a single dose of 3 cc. of the latter drug will completely cure 90 per cent. of cases was not borne out by the author's results.

H. H. S.

PEYRE (E. L.). **Le tétrachlorure de carbone dans le traitement de l'ankylostomiase.**—*Bull. Soc. Path. Exot.* 1924. Feb. 13. Vol. 17. No. 2. pp. 145–146.

Carbon tetrachloride has lately been used in place of oil of chenopodium for the treatment of ankylostomiasis in Cayenne and Saint-Laurent with excellent results. 113 patients were treated at Cayenne and 34 at Saint-Laurent. 3–4 cc. were given on two or three successive days, and on the third or fourth day 30 gm. of sulphate of magnesium or sodium ; no preparation such as alteration of diet was made. Three doses proved much better than two, the latter giving 41 per cent. of successes, the former 76·4 per cent. at Saint-Laurent, and 80·5 per cent. at Cayenne. The drug is preferred by the patients to either oil of chenopodium or thymol, and the cost is only about one-fortieth that of the former. In spite of the reputed risk of damage to the liver one case of cirrhosis with ascites was treated without any ill-effects.

H. H. S.

HALL (Maurice C.) & SHILLINGER (Jacob E.). **The Effect of Magnesium Sulphate, simultaneously administered, on the Efficacy and Safety of Carbon Tetrachlorid for the Removal of Hookworms.**—*Amer. Jl. Trop. Med.* 1924. Jan. Vol. 4. No. 1. pp. 1–12. [13 refs.]

Experiments on six dogs infested with hookworm shewed that the simultaneous administration of magnesium sulphate with carbon tetrachloride did not impair the efficacy of the anthelminthic, yet increased the safety factor on account of the decreased absorption of the drug. The combination deserves a trial in human cases.

R. T. L.

CORRECTIONS.

In the review of Dr. G. C. SHATTUCK's paper on " Clonorchiasis in Boston," published in the *Bulletin*, Vol. 21, No. 3, p. 197, it is stated that the 54 cases cited occurred in Japanese. Of these two cases were briefly described. For " Japanese " one should read Asiatics. The two cases described by the author were Japanese, but the remaining 52 cases quoted as reported by Dr. NUTE from among immigrants were Chinese. [Dr. SHATTUCK has kindly directed attention to this error.]

R. T. L.

On page 212 in the review of SHATTUCK's "A Case of Filariasis apparently contracted in Boston," the reviewer's spelling of *Charleston*, referred to as the one active endemic focus in the south, has unfortunately been altered by the printer to *Charlestown*, thus creating confusion with Charlestown, Boston, Massachusetts, where the case recorded actually occurred.

A. G. B.

REVIEWS AND NOTICES.

ARAUJO (H. C. de Souza). **A Lepra. Modernos estudos sobre o seu tratamento e prophylaxia. (Artigos de propaganda sanitaria e vulgarização scientifica, publicados na "Folha do Norte" de 1921 a 1923.)** [Leprosy. Studies on its Treatment and Prophylaxis.]—*Departamento Nacional de Saude Publica. Serviço de Saneamento e Prophylaxia Rural no Estado do Para.* 1923. 102 pp. With 4 illustrations.

This book, written by the Director of the Sanitary Service of the State of Pará, is of the nature of a condensed treatise on leprosy. In a review such as this one cannot do more than indicate the scope of the work and lay stress upon a few of the chief points.

Among the introductory remarks the most important transmitting agents are stated to be *Culex fatigans* and *Culex pipiens.* The disease is divided into the stages of Primary Infection, usually unperceived, followed by an Incubation period of three to five years, as a rule. Various prodromal symptoms next make their appearance in the form of itching, burning eruptions, obstinate catarrh and transient febrile attacks. The symptoms and signs of the disease itself are then described. It is stated that in nodular leprosy the Wassermann reaction is positive in 100 per cent. Section 5 deals with attempts at cure, with a brief incidental discussion of the question of spontaneous cure. Various vaccines—Clegg's Bayer's, Kedrowsky's, and others, and Nastin B.—are mentioned, and chemotherapy by salvarsan, its derivatives and allies, and copper preparations. The succeeding eight sections deal with chaulmoogra oil: its sources, the different methods of treatment by its means, special mention being made of the work of Sir Leonard ROGERS, MUIR and PEACOCK, in India, followed by an account of the ethyl esters of the oil, giving in detail the technique of their preparation. Chaulmoogra oil as obtained in Brazil and its employment for the treatment of the disease in that country next claim attention, and the author states that its "specific action is as a direct chemicotherapeutic agent and not as a stimulus to phagocytosis." He then turns to the disease as seen and treated in Brazil; the mode of life of the patients is described, and it is stated that 200 cases have been cured there in two years by the ethyl esters of the oil prepared by Drs. HOLLMAN and DEAN, of Honolulu; that 25 per cent. of those in the hospital have been apparently cured, judging by clinical and bacteriological tests, none of those sent out, even so long as two years ago, having shown any signs of relapse.

In section 13 the author describes the methods adopted in the service of which he is the head. Within three months of inauguration of the Preventive Institute 778 lepers had been examined. The material used for injection is prepared locally as follows:—Chaulmoogra oil 600 gr., camphorated oil 600 gr., and resorcin 40 gr. are well mixed and heated in a waterbath at 60°–70°C. for half an hour till completely dissolved, then filtered while hot, tubed and autoclaved at 125°C. for half an hour. The initial dose for adults is 1 cc., increasing to 3–4 cc. given intramuscularly. After 20 to 30 injections during a period of three months there is definite improvement, which is very marked in six months. General hygiene—diet, baths, ventilation, sunlight—and symptomatic treatment also receive attention.

Subsequent sections deal with the housing of lepers, the establishment of the agricultural colony system, and a description is given of the projected "Lazaropolis of Prata," dealing with the questions of site, the buildings and their arrangement, the numbers of patients to be accommodated, and general administrative measures.

The book terminates by quoting the conclusions and resolutions of the American Leprosy Conference held at Rio de Janeiro in October, 1922.

H. Harold Scott.

DE QUERVAIN (F.). [Professor of Clinical Surgery in the University of Berne.] [Translated from the French by SNOWMAN (J.).] **Goitre. A Contribution to the Study of the Pathology and Treatment of the Diseases of the Thyroid Gland.**—pp xii+247. With 118 illustrations & Bibliographical Appendix. 1924. London: John Bale, Sons & Danielsson, Ltd., 83–91, Great Titchfield Street, Oxford Street, W.1. [Price 21s.]

Professor F. de Quervain's book on "Goitre" is a most interesting contribution to the study of the Thyroid Gland and its diseases. It represents the views of the Berne school, which in the past has contributed largely to our knowledge of the subject. Dr. Snowman is to be congratulated on the excellence of his translation of the book from the French. It is in the main a treatise on the surgical aspect of goitre and is intended to act as a guide for those in search of a method of operative procedure rather than for those who are satisfied with their own. The first eight chapters deal with the surgical anatomy, physiology, aetiology, pathological anatomy, pathological physiology, diagnosis, prophylaxis, and non-operative treatment of goitre. These chapters, in addition to the fifteenth and seventeenth, provide instructive and up-to-date reading for the physiologist and physician as well as for the surgeon. From the ninth to the fourteenth chapter Professor de Quervain deals with his main theme: the operative treatment of goitre. Chapter fifteen, devoted to the surgery of thyroid deficiency, provides opportunity for the discussion of hypothyroidism, and more particularly of cretinism, and deals with the relation of thyroid inadequency to imbecility and idiocy, cerebral diplegia, "nervous cretinism," slight functional disorders of the nervous system, and to deaf-mutism. Chapter sixteen deals with the practical aspects of the diagnosis and treatment of Graves's Disease. For Dr. de Quervain surgery is the method of dealing successfully with this condition—a view which is less likely to be generally accepted as our knowledge of the causation of Graves's Disease increases.

This book can be recommended to all those who desire to possess an authoritative guide to the thyroid gland and its diseases. It is well illustrated.

R. McCarrison.

MEDICAL RESEARCH COUNCIL. **Diphtheria. Its Bacteriology, Pathology and Immunology.** [ANDREWES (Frederick W.), BULLOCH (William), DOUGLAS (S. R.), DREYER (Georges) & GARDNER (A. D.), FILDES (Paul), LEDINGHAM (J. C. G.) & WOLF (C. G. L.).—544 pp. With 6 plates & 15 text figs. 1923. London: Published by H.M. Stationery Office. [Price 12s. 6d. net.]

This monograph is designed to include all that is real knowledge concerning the bacteriology of diphtheria. The rather novel method of compilation is described in the preface. The eight authors, all expert bacteriologists, are conjointly responsible for all the book contains, and nothing was passed on to the printers unless it satisfied them all. The result is much more readable than might be expected. When studying the work one feels a sense of confidence in the argument such as is rarely experienced in the perusal of ordinary medical literature. In the volume, which contains 544 pages, more than 120 are devoted to a bibliography which the authors consulted. This bibliography is admitted to be incomplete, as many papers were not considered of sufficient merit to be inserted. The magnitude of the task of making this book cannot be better realized than by studying this interminable list of references.

Chapter I. gives a brief history of diphtheria. It is instructive to note how, in diphtheria as in other infections, the older literature was vague and chaotic until the discovery of the causative bacillus by **Klebs** in 1883, followed by **Loeffler's** masterly investigations on the characters of the organism and its relation to clinical diphtheria.

In Chapter II. the morphology and cultural characters of the diphtheria bacillus are described. The authors, following the latest attempt at a scientific classification of the bacteria, name the organism *Corynebacterium diphtheriae.* The chief characters of the bacillus are its pleomorphism; short and long, barred, "streptococcal" and branched forms, occur in varying proportions in nearly all strains to such an extent as to make any morphological classification of the strains and types of bacilli unreliable. All true *C. diphtheriae* stain by Gram's method and show metachromatic granules with suitable stains. For this purpose Neisser's method (or one of its modifications) still holds its own against others. Diphtheria bacilli always ferment glucose but not sucrose. Any organism that does not satisfy these conditions is not *C. diphtheriae.* There are, however, avirulent bacilli similar in all these respects except that they fail to produce toxin. The final proof that a bacillus is a real potential cause of diphtheria has to be made by an animal virulence test.

Chapter III. reviews the metabolism and toxin production of the diphtheria bacillus. The subject is highly technical and includes a criticism of the action of "endotoxin" apart from the familiar "exotoxin." The authors conclude that diphtheria endotoxin is of no proved value in the preparation of therapeutic sera or for use as a vaccine to treat diphtheria carriers.

Chapter IV. deals with diphtheria antitoxin and its preparation. Serum taken from immunized horses can now be concentrated so as to contain 3 to 5 times the concentration of antitoxin that was originally present; and non-essential proteins can be removed to such an extent that the concentrated serum contains only the same amount of protein as is present in normal horse serum, *i.e.*, 7-8 per cent. This is a technical achievement of great importance, because for therapeutic uses as little foreign protein as possible should be introduced with the requisite dose of antitoxin.

Chapter V. is on the pathology of diphtheria. The most constant lesions in a guineapig which has been killed by an injection of diphtheria bacilli are haemorrhages into the adrenal glands causing them to appear pink to black-red instead of the normal white. In man the adrenals in a fatal case of diphtheria rarely show naked-eye changes. The brunt of the mischief apart from the local condition falls on the heart and nervous system. The heart may show any kind of degeneration in both muscle-cells and interstitial tissue. As regard the nervous changes in man due to diphtheria bacillus, there is still considerable lack of agreement as regard details. However, all authorities concur that most change takes place in the peripheral nerves, especially those supplying any part which is actually paralysed.

Chapter VI. expresses the modern views on the laboratory diagnosis of diphtheria. First of all the clinician must realize he alone is responsible for the diagnosis and immediate treatment of his patient. The laboratory report is useful confirmatory evidence, but treatment of clinical diphtheria must not be delayed until the laboratory report arrives; and should the result be negative it is no excuse for withholding antitoxin from a patient, clinically diphtheria. Secondly as regards the pathologist. Reports on directly stained films are to be deprecated, except in a few cases where numerous and unmistakeable bacilli are seen, when a tentative positive report may be justifiable. Cultures from throat swabs on Loeffler's medium, which still holds its own for this purpose, give twice as many positive results as directly stained smears. For practical purposes, if bacilli morphologically identical with *C. diphtheriae* are seen in a 16 to 48 hours culture from a throat of a clinical diphtheria case they may be presumed to be virulent. This presumption is only justified when culture has been made from a membranous sore throat; in all other cases an attempt must be made to isolate the bacillus and test it for virulence, when, as likely as not, it will prove to be harmless. The various virulence tests are described, namely "whole mixed primary culture," pure sub-culture, and intracutaneous.

In Chapter VII. the serum treatment of diphtheria is discussed. The subject is so important that the authors' own summary of their opinions will be given.

"All cases clinically diagnosed as either definitely or probably diphtheria should be given antitoxin at once, unless the disturbance of health is extremely slight. A swab must always be taken, but it is only in very mild and doubtful cases that it is justifiable to withhold antitoxin for 24 hours in waiting for the result of a bacteriological examination . . . .

"Dosage should be based on the figures given in table below. A single dose containing the total quantity of antitoxin required by the case is considered by most modern authorities to be the ideal method of treatment. This dose (if very large) may be given partly into a vein and partly into the muscles. In some cases part, at least, of the dose should always be given intravenously."

Dosage table modified and abbreviated.

Infants under two years	3,000—10,000 units
Children under 15 years	4,000—20,000 units
Adults	5,000—50,000 units

First figure only for very mild cases, last figure for severe and malignant cases. For mild and moderate cases the serum should be given into the muscles, for severe and malignant cases the intravenous route is advised. When in doubt always give the larger dose and repeat early if there is no amelioration of the symptoms. Serum disease and so-called "anaphylaxis" have always been a bogey to many practitioners. This fear of accidents following serum treatment has probably caused many more deaths indirectly than have even been directly caused by the injection of foreign protein into the human body; therefore some opinions of the authors on this subject are important.—(1) Concentration of antitoxin is the most promising means of reducing the incidence of serum sickness.

(2) It is doubtful if true anaphylactic shock ever occurs in man.

(3) Accidents after inoculation are so rare that no physician should ever withhold antitoxin because of them.

(4) Accidents and severe serum sickness are more common after a previous injection and when the antitoxin is given intravenously. Therefore intravenous reinjections should be reserved for severe cases only.

The next two chapers, VIII. and IX., are, in the reviewer's opinion, the most interesting in the book. For almost the first time the experimental method has been used in the study of epidemiology. This has been rendered possible by the fact that diphtheria is unique among common epidemic diseases in producing an easily recognised antitoxin in the immune. The absence of this antitoxin in those susceptible to diphtheria is proved by injecting very dilute toxin into the skin when an inflamed red patch at the site of inoculation shows there is no antitoxin present to inhibit this reaction. This is the rationale of the Schick test, whose applications are described in the study of the spread of diphtheria.

Chapter IX. describes diphtheria prophylaxis. Passive immunization with serum and active immunization with toxin antitoxin mixtures are discussed. The carrier problem receives attention, and it is worth noting that the authors consider surgical interference the only hopeful cure for the chronic diphtheria carrier.

Chapter X. ends the book, and the reviewer has read no better attempt at dispersing the mist of vague conceptions usually conveyed by the word "diphtheroid."

In conclusion, the book is a mine of information, though it has only been possible to review one or two points of more general interest. To anyone who is working on the subject it is indispensable for reference purposes. The authors are to be congratulated on their masterly summary of the scientific basis of our knowledge of diphtheria. It is earnestly hoped the Medical Research Council will undertake the production of other works of a similar kind on different subjects, and thus save from despair those seekers after truth who have neither time, opportunity, nor sufficient experience to search and sift for themselves that vast mass of fact and fiction known as "the literature" of a subject.

The monograph contains no reference to any tropical aspects of the bacteriology of diphtheria, perhaps because no essential difference exists in the laboratory procedures concerned at home or abroad.

S. F. Dudley.

DOHI (Keizo). **Beiträge zur Geschichte der Syphilis insbesondere ueber ihren Ursprung und ihre Pathologie in Ostasien.** [The History of Syphilis, with Special Reference to its Origin and Pathology in Eastern Asia.]—145 pp. With 25 figs. & 4 plates. 1923. Tokyo: Verlag von Nankodo, Hongo Harukicho 3 chôme.

This is an amplification of a work in Japanese, which was published in 1921 by the same author, who is Professor of Dermatology and Urology at the University of Tokyo. About half of the book is devoted to the consideration of the origin of syphilis, and of its first appearance in the Far East. The author has studied personally the old Chinese and Japanese literature on the subject, as a result of which he opposes the opinion of SCHEUBE and others that syphilis existed in China and Japan before the sixteenth century. He has also considered the human tibia and fibula found in 1895 near Tokyo, and considered by ADACHI to show evidence of the existence of syphilis in the Stone Age; he quotes ADACHI's description of the bones, but he doubts both their antiquity and the nature of the pathological condition they are said to exhibit.

It appears that the ancient Chinese medical authors do not describe any disease that can be identified indubitably with syphilis, though a book of the seventh century gives a recognizable description of a soft chancre. As regards Japan, the book *Daido-rui-ju-ho*, attributed to the ninth century, was considered by SCHEUBE to prove the existence of syphilis at that time; but the author agrees with OKAMURA that the date ascribed to this book is inaccurate. He points out that the descriptions of the symptoms are too objective and modern, and contrast too forcibly with those of other old Japanese authors. He considers that this book may possibly date from the sixteenth, but more probably from the seventeenth century.

According to HIRSCH ("Geographical and Historical Pathology"), "in the Ayur-Veda of Susruta, there are several statements which make it at least very probable that venereal disease had occurred in India from the very earliest times." Dr. Dohi is of opinion that the descriptions are too vague and insufficient for such a conclusion. He considers that syphilis is a new-comer in India as in the rest of Asia. He argues that many diseased conditions of the skin, such as occur in leprosy, scabies, elephantiasis, etc., are described with much accuracy in the works of ancient Asiatic authors; if syphilis occurred in olden times, its remarkable effects on the skin, mucous membranes and bones, could not have escaped the notice even of laymen. Why, then, does one not find a description of syphilitic conditions with the unmistakable clearness with which accounts are given of these other diseases? He also points out that special attention was paid to the genital organs in countries where phallic worship prevailed, and yet there is no certain description of syphilitic chancres.

Dr. Dohi accepts the theory of the American origin of syphilis, and of its first appearance in Europe after the return of Columbus to Spain, soon after which the disease prevailed throughout almost the whole of Europe in the form of a severe epidemic.

The first documentary evidence of the existence of syphilis in China is found in a book, *Tsuk-i-shut*, which appeared in 1545, where it is stated that the disease occurred towards the end of the time of *Hung-chih*

(1488–1505); this is confirmed by other contemporary works. About ten years after the return of Columbus, and one to ten years after the landing of Vasco da Gama in India (1498), syphilis broke out in epidemic form at Canton. The Portuguese took Ceylon in 1505, Malacca in 1509, and Canton in 1515–17. The outbreak in Canton occurred about fifteen years before the arrival of the Portuguese; most likely it was brought there by Chinese seafarers from the Southern Seas. So, too, in Japan, syphilis was recognized about thirty years before the Portuguese came to that country; it seems to have been introduced from two sources, on the one hand from the Liukiu Islands, and on the other from China.

The author does not discuss the reasons that have been brought forward against the supposition that the original home of syphilis was America. And the fact that he has not been able to find any undoubted description of the disease in the writings of Chinese, Japanese or Indian authors prior to the sixteenth century does not necessarily imply that syphilis did not occur in Asia before that period. There is a similar lack of exact description in the works of ancient European writers, though, according to Hirsch, "The Paris physician, Gérard de Barry (thirteenth century) refers to an '*alteratio totius corporis,*' resulting from '*ulceribus et apostematibus virgae,*' which must mean a constitutional malady associated with a preceding infection of the '*virga.*'" From the nature of the disease it seems unlikely that secondary and tertiary symptoms and lesions would be considered to have any connexion with a primary chancre until the study of pathology had made considerable progress, and until syphilis had attracted general attention by its presence as a wide-spread epidemic. It is not at all surprising, therefore, that the old authors did not describe the disease as a coherent whole.

The second part of the book is occupied by an account of the growth of the knowledge of the pathology of syphilis. The author gives an interesting survey of the Chinese and Japanese literature from the sixteenth century onwards. Rapid advances in knowledge were made, largely as the result of Portuguese and Dutch influence on Oriental medicine. About the middle of the eighteenth century, an admirable account of practically all the manifestations of syphilis was given by the Japanese physician, KAGAWA.

Dr. Dohi's book is written in an attractive style, and his personal study of the old Chinese and Japanese authors gives it an exceptional value. It is embellished by a number of interesting illustrations.

H. J. Walton.

MENSE (Carl). **Handbuch der Tropenkrankheiten. 2te Auflage. Band 4. Zweite Hälfte.**—pp. 301–777. With 145 text figs., 13 charts and 2 coloured plates. 1923. Leipzig: Johann Ambrosius Barth.

Die Blutprotozoen und ihre nächsten Verwandten. (von Dr. R. KUDICKE.) Chagas'sche Krankheit. (Amerikanische Trypanosomenkrankheit.) (von Dr. Martin MAYER.) Rückfallfieber, (von Prof. Dr. Joseph FORSCHBACH.) Kala-Azar oder innere Leishmaniosis. (von Prof. Dr. Umberto GABBI.) Wenig bekannte Krankheitsbilder und Krankheitsbezeichnungen. (von Prof. Dr. C. MENSE.)

This volume, which contains articles on the Blood Protozoa, Chagas' Disease, Relapsing Fever and Kala Azar, together with an appendix on certain little-known tropical diseases, is similar to other volumes of this well-known series. The standard of these articles, which give an account of the subjects as they stood two or three years ago, is undoubtedly a good one. The illustrations, though not of a particularly high grade, are instructive and serve the purpose for which they were intended. There are lengthy bibliographies of literature, extending to about 125 pages.

The first article, which deals with Blood Protozoa, is divided into two sections, the one describing the flagellates together with the closely allied forms in insects, the other the Sporozoa, the affinities of which are explained by an introductory account of the Coccidia with which they are closely related. The section devoted to the blood flagellates occupies 194 pages and deals with the trypanosomes of mammals, birds, reptiles, amphibia and fish, the leishmania, and the insect flagellates belonging to the genera *Herpetomonas*, *Crithidia* and *Rhynchoidomonas*. The morphology, development, method of transmission and inter-relations of these various types is fully described. The pathogenic trypanosomes of man and animals receive special attention. It may be noted that *T. cazalboui* and *T. vivax* are regarded as distinct species, though there is much evidence in favour of their identity. The same remark applies to *T. pecorum* and *T. congolense*. In the second section, which extends to 108 pages, the life-histories of coccidia of the genera *Eimeria* and *Adelea* are first described and reference is made to the coccidia of man. The position of the blood-inhabiting Sporozoa in relation to the intestinal coccidia is carefully explained and, following the results of recent investigations, particularly those of Nöller and Reichenow, the blood Sporozoa are arranged in two groups according as the fertilization process is of the *Adelea* or of the *Eimeria* type. In the former are included the haemogregarines and the leucocytozoa of birds and in the latter the pigmented parasites, which are regarded as belonging to four genera—*Haemoproteus*, *Plasmodium*, *Proteosoma*, *Haemocystidium*. It is very doubtful if the Leucocytozoa are as nearly related to the haemogregarines as such a system implies, while it seems probable that the genera *Proteosoma* and *Haemocystidium* should be submerged in *Plasmodium* and *Haemoproteus* respectively. The whole article on the Blood Protozoa is a most comprehensive one and presents the reader with a vast amount of reliable information regarding these parasites.

The article on Chagas' Disease covers 8 pages. In consequence of its shortness, which was intentional, it is less complete than others. Nevertheless it is free from errors and gives all the essential facts. Relapsing fever as it occurs in the tropics is dealt with in 67 pages. The disease is first discussed in a general manner from the clinical, pathological and parasitological points of view, after which the Central African, North African, American and Asiatic types are individually considered, while a final section deals with the treatment of the disease. The last of the four articles is on Kala Azar, and in the 40 pages the disease is considered in all its aspects. In a final appendix are to be found notes on about 80 diseases or conditions of unknown aetiology which have been recorded from the tropics. This forms a very useful compendium which will be of service for purposes of reference.

C. M. Wenyon.

Simon (Charles E.) [B.A., M.D., Lecturer in Medical Zoology, School of Hygiene and Public Health of the Johns Hopkins University.] **A Manual of Clinical Diagnosis by Means of Laboratory Methods for Students, Hospital Physicians and Practitioners.**—pp. xxiv+1125. With 233 engravings and 23 plates. 10th Edition, enlarged & revised. 1922. London: Henry Kimpton, 263, High Holborn, W.C. [Price 42s.]

The exigencies of modern practice demand of the clinician an ever-increasing intimacy with the methods of the laboratory, and the fact that this work has reached its tenth edition in the comparatively short span of twenty-five years bears some testimony to its value and to the success of its author's efforts to keep it " up to date."

The book is divided into two parts: Part I. treats of General Principles and Technique, and embraces all the commoner methods employed in laboratory diagnosis. Part II. deals with the Essential Factors in the Laboratory Diagnosis of Various Diseases.

No less than 294 pages are devoted to the examination of the blood. A great deal of attention is given to the descriptions of stains and staining methods, and graphic formulae of some of the more important anilin dyes are shown, but, on the other hand, in dealing with some of the other methods of blood examination there is a tendency to restrict descriptions to a single method or to a single instrument out of several in common use. A valuable feature of the section is the brief but lucid accounts of the biochemical methods employed in the quantitative estimation of blood-sugar, blood-urea, cholesterol, fats and fatty acids and other constituents of the blood.

A matter calling for special criticism is the description of the Iso-haemolysins and Iso-haemagglutinins of normal blood (p. 239). The theory of agglutinins and agglutinogenesis and their groupings is very clearly expounded, but the description of Moss's groups is rather confused and, in parts, inaccurate, possibly due to some confusion with the system of LANDSTEINER. A diagram from SANFORD graphically illustrating the interactions between the corpuscles and sera of the different groups serves, however, to clear up many of the obscurities in the text.

In considering tests for syphilis the Wassermann modifications of NOGUCHI are dealt with briefly, and mention is made of BERGHAUSEN's cold-fixation method, but a lengthy account is given of the author's own modification, the special features of which are the preliminary absorption of any anti-sheep-cell amboceptor present in the human test sera by saturation with washed sheep cells, and a quantitative determination of *syphilitic antibody* based on the author's thesis that the velocity of complement fixation is directly proportionate to the quantity of syphilitic antibody present. Thus *instant fixation* of the complement by the test serum in the presence of the lipoid antigen without incubation is stated as Wassermann 100 per cent. or 60 units, while sera requiring sixty minutes' incubation for fixation are said to be Wassermann 1 per cent. or 1 unit, and other quantities are calculated in a similar manner. It is claimed for this method that it gives fewer erroneous results than the *standard* methods, and that it readily distinguishes between the pseudo-positives which occur in scarlatina, malaria, &c., and the true positives of syphilis. If this claim can be substantiated, the apparent tediousness of the method will be fully recompensated. Other serological tests dealt with are the flocculation reactions of SACHS-GEORGI and MEINICKE.

The section on blood is completed by a short account of the Reaction of Abderhalden and its applications. One regrets to find in this admirable and almost exhaustive section no mention of the biological tests for the identification of "human" blood, but such an inclusion might rightly be considered out of place in a book on *clinical* diagnosis.

The Gastric Juice and Stomach Contents are dealt with in a chapter of 45 pages, which includes test meals, methods for obtaining material from the stomach and duodenum, and clear descriptions of the commoner biochemical tests. An excellent account of the Refuss method for fractional study of gastric digestion is also given. This is followed by a chapter of 250 pages on the Faeces, of which 30 pages deal with methods of examination in common use, and five pages with the chemistry of the faeces. Both could with advantage be amplified. The remaining 215 pages treat of the animal parasites infesting the bowel, and include the study of their morphology, life-history and geographical distribution, as well as methods of examination.

The chapter on the urine occupies 200 pages and is one of the most valuable in the book; 140 pages are devoted to chemical and 40 to microscopical examination. Renal functional tests are dealt with rather briefly, and the important quantitative diastase test is not included.

Part II. of the book deals with the essential factors in the laboratory diagnosis of various diseases in alphabetical order and forms a useful reference guide. In some instances, however, factors are discussed which have but little bearing on diagnosis, while in others the really vital points are omitted; thus in rabies the blood and urine alone are referred to.

Regarding the book as a whole, the contributions on biochemical methods and on animal parasitology are excellent, the descriptions are clear and well illustrated, and in this respect the book should possess a considerable value to the laboratory worker. Concerning the bacteriology, however, one must confess to some disappointment. There is a constant tendency to sacrifice clearness to brevity, and apart from slips some definite errors occur; as examples, the statements that *M. melitensis* is motile (p. 821) and *B. mallei* has a spore at one end (p. 824). In a short table on page 379 the milk reactions of *B. typhosus* and *B. paratyphosus* A are transposed. *B. paratyphosus* A is also shown as fermenting lactose with aerogenesis and acidity and forming no gas from mannitol, while *B. paratyphosus* B is stated to have no action on mannitol and to form no gas from dextrose. It is also stated that "fungi with the exception of *Oidium albicans* are rarely found in the faeces," but that *Saccharomyces cerevisiae*, which is described as a schizomycete, "is one of the normal constituents of the faeces." In the special bacteriological appendix the two methods recommended for the standardization of the reaction of culture media are not sufficiently accurate, and more detailed instructions in the preparation of media are desirable.

The book is of convenient size and is well got up, and the quality of the paper, the printing and the binding reflects credit on the publishers. The illustrations, both colour plates and text figures, are excellent, with the exception of one on page 193, attributed to Doflein. However, if the book is to continue its career of usefulness and keep pace with the rapid development of knowledge in the ancillary subjects it would seem that the time has come for the author to enlist the aid of specialist contributors for these subjects.

J. T. Duncan.

TROPICAL DISEASES BUREAU.

TROPICAL DISEASES BULLETIN.

Vol. 21.] 1924 [No. 8.

MALARIA.

PEREIRA (Miguel). **Formas clinicas da malaria (Trabalho posthumo).**—*Arch. Brasileiros de Med.* 1924. Jan.. Vol. 14. No. 1. pp. 1–32. With 1 plate & 8 graphs.

This posthumous paper, leaving a clinical record of malaria as existing in Brazil, will be welcome to those there practising. The details of the picture naturally correspond with those prevailing elsewhere. Benign tertian malaria, for instance, undergoes as a rule in Brazil rapid spontaneous or therapeutic " cure," but is subject to relapse and rarely ends fatally. Quartan malaria is perhaps entirely absent.* Subtertian malaria manifests but rarely pernicious attacks; such attacks being almost always formidable episodes in a primary and recent infection, but not always limited to subtertian malaria. The existence of acute apyretic or " larval " infection is emphasized.

Clayton Lane.

BOUFFARD. **Le paludisme en Émyrne. Étude prophylactique et thérapeutique.**—*Ann. de Méd. et de Pharm. Colon.* Paris. 1923. Sept.–Oct.–Nov.–Dec. Vol. 21 [23 *sic*]. No. 3. pp. 282–323.

In Madagascar, malaria is caused by all three species of parasites, the quartan being predominant in many localities, at least from June to December, Prevention has been mainly by administration of quinine to children, apparently at school. It has proved disappointing. This is attributed to two factors: (1) The reservoir furnished by children of lower age and by adults; (2) the abundance of mosquitoes, mostly breeding in rice fields. It is consequently held that for Europeans there should be quinine prophylaxis for 7 to 12 months, according to locality; and for natives quinine for the infant reservoir in doses of not less than 30 cgm. or preferably 40 to 50 cgm. in children of two to six.

In acute cases the treatment recommended is 2 gm. daily by mouth for three or four days, and thereafter 65 cgm. every evening, for eight weeks. Yet on account of the amount of quinine required, and its expense, an alternative of intramuscular injection of 1 gm. of quinine on three consecutive days is mentioned. Of 20 cases so treated three relapsed on the 30th day; in the others no parasites were detected in the cutaneous blood within 45 days, a finding which apparently applies to tertian malaria. For subtertian malaria with crescents, which is held synonymous with cachexia, the minimum treatment needed to cause disappearance of these is 1 gm. of quinine daily by intramuscular injection for a period variously stated as from 20 to 25 days, the gametes of tertian malaria disappearing under a daily dose of 25 cgm. daily for a week or two. It is mentioned, however, that where quinine prophylaxis was in use its effect on the parasite index was negligible. Splenic and parasite indices were found to be in correspondence. Other recommendations are:—the search in Madagascar for a site suitable for cinchona cultivation; and the detection of those breeding-places which the anopheles specially favours. These are then scrupulously preserved for her convenience and her pestilent progeny periodically destroyed before pupation ends.

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* But see this *Bulletin*, Vol. 7, p. 97.

C. L.

BLASQUEZ BORES (F.). [**El paludismo en el ejercito y sul importancia social.** Malaria in the Spanish Army.]—*Thèse Méd.* Madrid. 1920.

ROMERA Y DOMINGO (J. A.). [**El paludismo en nuestra zona de influencia en Marruecos.** Malaria in the Spanish Zone in Morocco.]—*Los Progresos de la Clinica.* 1919. Nov. Vol. 7. pp. 228–234. With 1 map.

ROYO VILLANOVA (R.). [**La salud en el Ejercito de Africa. El Paludismo en Yebala y en el Rif.** Health of the Spanish Army in Africa. Malaria at Yabala and Rif.]—*Leçon d'ouverture de la chaire de médecine interne,* 1921–1922. *Saragosse.* 12 pp.

OJERO (J. P.), REDONDO (A.), BLANCO (J.), DELGADO (E.), CID (R. F.) & PALANCA. [**El paludismo de la zona del protectorado español en Marruecos y medios para combatirlo.** Malaria and its Prophylaxis in the Spanish Zone in Morocco.]—*Rapport de la Commission, Ministère de la guerre. Madrid,* 1921. 62 pp. With several maps.

[All summarized in *Bull. Inst. Pasteur.* 1924. Jan. 31. Vol. 22. No. 2. pp. 78–79.]

OBERLÉ & VIALATTE (Ch.). **Paludisme et lutte antipaludique dans les troupes d'occupation du Maroc.**—*Arch. Méd. et Pharm. Milit.* 1923. Nov. Vol. 79. No. 5. pp. 700–728. With 2 charts & 1 map. [15 refs.]

In 1917–18 a third of the Spanish army in Morocco was immobilized by malaria, some 11,000 men spending 318,310 days in hospital. A battalion of 890 men had 286 cases and 32 deaths in one year. It is held that 50 per cent. of the personnel of the army are infected with malaria in their first twelve months of service there. The Commission makes useful recommendations regarding propaganda, the establishment of an anti-malarial service, and, in addition to the usual preventive measures, the setting up in Morocco itself of convalescent sanatoria, with the refusal of convalescent leave out of the country after malaria.

In French Morocco admissions to hospital for malaria per thousand effectives fell from 83·9 in 1913 to 13·1 in 1919. The figure for 1922 was 24·6. Racial morbidity from this cause per thousand was 35·22 for Europeans, 11·66 for indigenous races and 1·97 for negroes. Quartan malaria is most rare; the other two kinds vary, not with locality but with season. The not infrequent occurrence, in those taking prophylactic quinine, of such symptoms as anaemia and vomiting, the *paludisme camouflé* of RIEUX, is emphasized, as is the difficulty of ensuring disinfestation out of hospital.

Prophylaxis is based on a medical administration and executive which combine in the same individuals both civil and military charges, forcing them to take a wide view-point. Of the value of preventive quinine the writers are convinced, but it is not clear whether the controls, in the striking experiences mentioned, were of the same race as those taking quinine. The prophylactic daily dose used was 40 cgm. of the hydrochloride; its expense in 1922 amounted to 1,200,000 francs. It is noted that a daily issue of quinine entails a daily survey of each man, and that the evasive attitude of these is in contrast with the behaviour of the "colonial," whose daily dose of quinine is scrupulously swallowed.

C. L.

BOREL (P.) & MAIRE (G. L. E.). **Étude sur le paludisme dans les territoires de la 2e division de l'armée française du Levant.**—*Arch. Méd. et Pharm. Milit.* 1923. Nov. Vol. 79. No. 5. pp. 729–752. With 4 plates & 1 map.

In the Levant, *Plasmodium falciparum* is much more frequent than *P. vivax*, at least from November to January; yet, apart from cases admitted moribund, no deaths occurred within this period. The only feasible prophylactic measure of general applicability is the administration of quinine. Having seen three deaths from its administration intramuscularly, out of hospital, the authors hold this method absolutely contraindicated unless carried out with the most scrupulous asepsis. Intravenous quinine is advocated when the five hours' delay of action entailed in oral administration has to be avoided. Sensitiveness to oral quinine is held so rare as to be negligible, the effects of malaria being too frequently attributed to the drug. The dose advised is 3 gm. of the hydrochloride daily except, say, Sundays, continued for four weeks in infection with *Plasmodium vivax*, and for 12 in that with *P. falciparum*.

C. L.

i. YOUNG (T. C. McCombie). **Notes on Malaria in Shillong.**—*Indian Med. Gaz.* 1924. Mar. Vol. 59. No. 3. pp. 117–119.

ii. SHORTT (H. E.). **The Occurrence of Malaria in a Hill Station.**—*Indian Jl. Med. Res.* 1924. Jan. Vol. 11. No. 3. pp. 771–789. With 5 charts. 2 plates & 1 sketch map.

i. The Director of Public Health, Assam, notes that Shillong, its Hill Capital, is almost certainly producing autochthonous malaria. Of the local anopheles with interest other than entomological *A. gigas* breeds in clear rocky pools from October till March, at which time the temperature prevailing is probably insufficiently high for the growth of Plasmodium. A few *A. aitkeni* appear at the end of the cold weather, but in April or May larvae of *A. maculatus* appear in isolated rock-bound sandy pools out of which early rain will flush them. Thereafter oviposition is transferred to marshes fed by seepage from hill springs. Irrigation channels are not implicated. Contour drains along the valley sides at seepage level are advised, central drains being strictly avoided.

ii. Shortt's paper contains further valuable details about malaria in Shillong. For the six years 1917 to 1922 investigated cases showed *Plasmodium vivax* in 175, *P. falciparum* in 202, *P. malariae* in 38, *P. tenue* in 2, mixed infections in 9. In years of highest incidence *P. falciparum* infection was also highest. August was the worst month. All these cases are not held to be indigenous.

C. L.

i. BULLETIN DES VOLKSKOMMISSARIATS FÜR GESUNDHEITSWESEN. 1923. Oct. 15. No. 20.—[**Malaria und Malariabekämpfung in Russland.** Malaria and its Control in Russia.] [Summarized in *Arch. f. Schiffs- u. Trop.-Hyg.* 1924. Apr. Vol. 28. No. 4. pp. 168–169.]

ii. IOFF (I.) & BOSCHENKO (W.). **Die Malaria in den Bezirken Dergatschy und Novousensk. II. Mitteilung Frühling 1923.**—*Rev. Microbiol. et Épidémiol.* Saratov. 1923. Vol. 2. Nos. 3–4. In Russian pp. 85–88. German summary, pp. 110–111.

iii. MARZINOWSKY, SCHUKOW & SSUTSCHKOWA. [**Malaria und Malariabekämpfung bei den Torfarbeiterern in den Schatursümpfen.** Malaria and its Control among the Peat Workers in the Shatur Peat Hag.] 1923. Moscow. [Summarized in *Arch. f. Schiffs- u. Trop.-Hyg.* 1924. Apr. Vol. 28. No. 4. pp. 169–170.]

i. In Armavir 90 per cent. of the inhabitants are ill of malaria, in Kasan cases have increased in one year from four thousand to forty thousand. In Ukraine a quarter of a million persons fell ill in the first seven and a half months of the year. In Dagestan the mortality was 17 per cent. In Turkestan the morbidity was over 90. The influence of the famine and consequent migration (this *Bulletin*, Vol. 20, p. 557) are mentioned.

ii. The districts of Dergatschy and Novousensk, over the Volga, had in 1922–23 a malarial morbidity of 64·6 per cent., representing an infection of 150,000 persons, and a splenic index in children of 30. The percentages of subtertian, tertian, quartan and mixed infections were in autumn, 86·6, 15·1, 3·5 and 5, and in spring 15, 85·2, 7·6 and 7·8 respectively.

iii. Among the peat workers in the regions of Moscow, Rjäsan and Wladimir (this *Bulletin*, Vol. 20, p. 961), 26·3 per cent. were proved malarial, 20·3 per cent. showing their first manifestation in winter and spring, starving migrants being again responsible. Nearly all the cases were of *Plasmodium vivax*.

C. L.

STEPHENS (J. W. W.). **Duration of Infection in Malaria.** [Miscellanea.] —*Ann. Trop. Med. & Parasit.* 1924. Apr. 30. Vol. 18. No. 1. p. 127.

A quartan malaria with latency in England for 5 years and a benign tertian case with similar latency for at least 23 months are reported.

C. L.

FRANÇOIS-DAINVILLE (E.). **Sur un cas de paludisme autochtone, à forme tierce bénigne, dans la région de Créances, Canton de Lessay (Manche).** —*Rev. Méd. et d'Hyg. Trop.* 1924. Mar. Vol. 16. No. 3. pp. 86–89. With 1 chart. [3 refs.]

A woman of 41 who had never left France fell ill while living at Creances, on marshy ground near Cherbourg, a spot at which colonial troops from that town spent leave. Benign tertian malaria was clinically and microscopically established. In the discussion a number of autochthonous cases occurring in Flanders and Normandy were mentioned.

C. L.

TRIMBLE (C. G.). **A Case of Congenital Malaria.**—*China Med. Jl.* 1924. Feb. Vol. 38. No. 2. pp. 121–123. [3 refs.]

A primipara experienced during the 8th and 9th months severe attacks of " malaria " and was treated with two grains of quinine every hour during the day, a daily total of 20 to 30 grains, for 3 days. The fever recurred in two or three weeks, the last on the day before delivery at full term. Quinine was given during the first fortnight of the puerperium and seemed to result in sterilization. The child kept good health for ten days, then became out of sorts, the temperature rose on alternate days, and when the blood was examined on its 21st day " malarial parasites, asexual " were found in large numbers. The writer says, " Perhaps the infection may have been transmitted to the infant by the bites of mosquitoes," and a little later " Parasites were doubtless in the blood stream when the child was born."

C. L.

DAVID (J.) & SÉGAL (J.). **Parasitisme intestinal et paludisme chronique.** —*Presse Méd.* 1924. Mar. 19. Vol. 32. No. 23. pp. 249–250.

Why, of malaria infections under identical conditions, do some only become chronic ? It is not due to persistence of gametes, for men can be degametized and yet relapse. It is not due to climate, which affects all equally. Some influence nocuous to erythrocytes is the reasonable explanation. It was found that in 52 chronic malarials the percentage harbouring intestinal parasites was 92, 80 per cent. harbouring *Trichuris trichiura,* while in 24 non-malarials, the corresponding percentages were 25 and 25. Diagnosis was by smear or by flotation with a 30 per cent. solution of common salt. The essential features of the stool concentration in the saline and of the method of removal of ova for examination are not mentioned. No ankylostome ova were found. May it not be possible that since trichuris is a blood feeder, and nematodes secrete toxins, under their influence erythrocytes may become vulnerable to, and more suitable for the development of plasmodia ; and that there will be so induced both liability to and chronicity of malaria ?

[Inability to agree with the particulars of the authors' argument does not entail non-concurrence with their hope that the matter will be further investigated.]

C. L.

CHRISTOPHERS (S. R.) & KHAZAN CHAND. **Measurement in Centimetres of the Enlarged Spleen in Children and its Correction for Size of Child by a Factor based on an Anthropometric Measurement.** —*Indian Jl. Med. Res.* 1924. Apr. Vol. 11. No. 4. pp. 1065–1080. With 1 chart. [3 refs.]

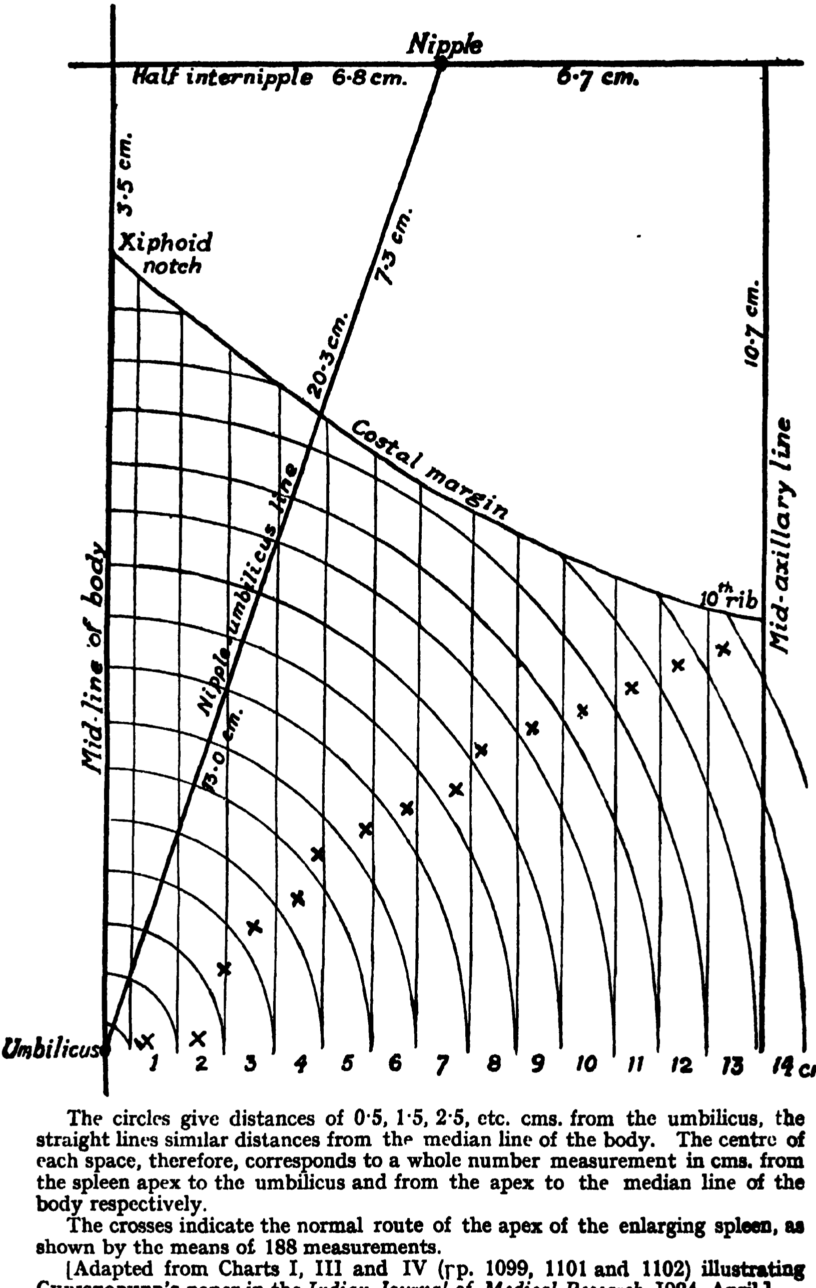
CHRISTOPHERS (S. R.). **The Shape and Position of the Palpable Portion of the Enlarged Spleen in Children.**—*Ibid.* pp. 1081–1102. With 5 figs. & 4 charts. [2 refs.]

——. **The Frequency Distribution of Measurements of the Enlarged Spleen in a Malarious Child Community.**—*Ibid.* pp. 1245–1252. With 4 figs. [1 ref.]

It will be remembered that the Fourth Congress of the Far Eastern Association of Tropical Medicine (this *Bulletin,* vol. 20, p. 551) appointed a Committee to decide upon the best means for international use of measuring the amount of splenic enlargement. The Committee decided that no known method could be advised as altogether satisfactory. Further investigation on the matter is here reported. It

STANDARD ABDOMINAL CHART.

[⅔rds actual size.]



The circles give distances of 0·5, 1·5, 2·5, etc. cms. from the umbilicus, the straight lines similar distances from the median line of the body. The centre of each space, therefore, corresponds to a whole number measurement in cms. from the spleen apex to the umbilicus and from the apex to the median line of the body respectively.

The crosses indicate the normal route of the apex of the enlarging spleen, as shown by the means of 188 measurements.

[Adapted from Charts I, III and IV (pp. 1099, 1101 and 1102) illustrating CHRISTOPHER's paper in the *Indian Journal of Medical Research*, 1924, April.]

deals with children only. It was first established that measurement in centimetres of the palpable portion of the spleen was practicable in the field, and could readily, by means of tables, be corrected for the size of the child; one with a sitting height of 60 cm. being taken as the standard or mean. Further, this correction was automatically made, and the mean automatically reached, if the community were large and homogeneous. It was felt, however, that, should a correction be required, it was more fitting that an abdominal organ should be corrected by a factor concerning the abdomen more directly than does the sitting height, and the nipple-umbilicus line is recommended as probably the best indicator measurement for ordinary purposes. Acceptance of the length of spleen palpable as an index of splenic enlargement involves the implication that the relative positions of spleen and costal margin are invariable. This was negatived by the Standard Abdominal Chart, that of a child with a sitting height of 60 cm., made thus: A vertical line represents the mid-line. On it mark the navel and xiphoid cartilage and fix the site of the nipples by their position on the inter-mammary line, the point of intersection of this and the mid-line being easily determined. Draw the mid-axillary line and the left nipple-umbilicus line. Note the position of the costal margin on the mid-line, nipple-umbilicus line and mid-axillary line, and draw it in with convexity downwards. Mapping on such a chart the degree of emergence of the splenic apex from the costal margin resulted in confusion, which disappeared when the position of the splenic apex was charted according to its distance from the navel. It is accordingly advised that the position of the splenic apex should be determined by 2 measurements, the radial distance from the navel and the horizontal distance from the mid-line, a sort of triangulation which fixes its position absolutely, and is all that is needful for the individual. To facilitate correlation of all the findings of a community there are added to the chart concentric circles round the umbilicus and lines parallel to the mid-line, each 1 cm. apart, the first circle and line being, however, only half a centimetre distant from navel and mid-line respectively. The centre of each diamond-shaped space so formed represents the corresponding position of the splenic apex, and a mark made within this area permits, rapidly and without confusion, of large correlations. It is found that but rarely does the splenic index fail to maintain its normal route.

Having regard, however, to the rarity with which the splenic apex deviates during enlargement from the normal route, it will suffice, in estimating the malarial incidence of a community, to use only one of these measurements, to mark on a standard malarial chart (upon which is indicated the tract of the apex of the enlarging spleen) a point on that track determined by one only of these measurements, the same measurement being, of course, always used unless correction is to be made. The malarial condition of a community will then be recorded by two figures, the spleen rate, and the size index; the greater the degree of enlargement and the shorter the distance of the splenic apex from, say, the umbilicus, the smaller will be the size index figure. Thus :—

	Spleen rate.	Size index.
Singhbum	72 ...	9·9
Nalbari	94 ...	7·3

C. L.

BOYD (Mark F.). **Splenomegaly in Malaria from an Epidemiological Viewpoint. A Review.**—*Amer. Jl. Trop. Med.* 1924. Jan. Vol. 4. No. 1. pp. 49–67. [22 refs.]

This review of literature on splenomegaly necessarily consists largely of material already noted in this *Bulletin.* In addition to the largely quoted observation of ROSS, PERRY & CHRISTOPHERS (this *Bulletin,* Vol. 3, p. 259) that the spleen rate of London school children was found to be 1·07 is mentioned that less known one by DARLING & BARBER (*Report of the Uncinariasis Commission to the Orient,* 1915–1917. International Health Board, 1920), that in Fiji where malaria is not endemic the spleen rate is 1·5.

C. L.

BÉDIER (E.), LAURENCY & BAURY. **Index endémique du paludisme à Niamey à la fin de la saison des pluies.**—*Bull. Soc. Path. Exot.* 1924. Apr. 9. Vol. 17. No. 4. pp. 327–329. [4 refs.]

At Niamey, the new capital of French Nigeria, the parasite index in 135 slides in October (the epidemic season) varies in different spots from 38·4 to 100, with a mean of 66·6, that of Zinder, the old capital, being 68·8. Of observed infections 58 were *Plasmodium falciparum,* 27 *P. malariae,* and 3 *P. vivax* ; 2 were mixed infection of the first two. The splenic index was lower than the parasite index, enlarged spleen being most common with *P. malariae.*

C. L.

WALRAVENS (P.). **Index malarien chez des enfants quininisés pendant trois mois.**—*Ann. Soc. Belge de Méd. Trop.* Brussels. 1924. Jan. Vol. 3. No. 3. pp. 257–260. (Discussion pp. 260–262.) [1 ref.]

It has not proved possible clearly to follow these experiments with quinine at Elizabethville, Belgian Congo, but it is obvious that 75 per cent. of those concerned received, if between 1 and 5 years of age, 75 cgm. of "quinine" daily for three days, and thereafter 10 cgm. daily for 3 months ; if between 5 and 10, one gm. and 20 cgm. respectively ; and if over 10, one and a half gm. and 30 cgm. The other 25 per cent. had the same initial doses for two days only and thereafter the same daily dosage as the first series. At the beginning of the course the spleen-rate in 2 schools was 77·5 and 35·3, at the end 21 and 4 respectively. Dr. VALCKE, in discussion, suggested that logic was forcing the daily administration of a curative dose for preventive purposes.

C. L.

ADAM (M.). **Le paludisme, à la consultation des nourrissons indigènes de Dakar.**—*Bull. Soc. Path. Exot.* 1924. Mar. 12. Vol. 17. No. 3. pp. 279–282.

During the period from 1st December, 1922, to 1st December, 1923, the Dakar crèche attended 7,637 children, of which 17·41 per cent. suffered from clinical evidences of malaria, the worst percentages being 31·78, 27·72, 28·5 and 32·25 for August, September, October, and November respectively. In these same months the parasite indices of 100 apparently healthy children, showing no other evidences of malaria, were 82·81, 70·17, 88·09 and 90·36 respectively. The conclusion that the real infection rate of children under 3 must be practically 100 is not unreasonable. High dosage of quinine for these children is advised, as instanced by a girl of 3 with high fever and convulsions who received in 4 days 5·5 gm. of quinine, namely 1 gm. intramuscularly on day 1, 1½ gms. intramuscularly on day 2, and 1½ gm. by mouth on day 3 and day 4, without toxic symptoms. For disinfestation a three months' course is advised, apparently arbitrarily, 0·2, 0·15 and 0·1 gm. daily being given orally for each respective month. The cost of 13 gm. of quinine for each child at its present local price is prohibitive. The Algerian procedure of the sale of State quinine is urged.

C. L.

VIVIANI (Rodolfo) & MARTINELLI (Giuseppe). **Studio sull' andamento dell' infezione malarica nel periodo interepidemico 1922–1923 in una zona del delta del Po (Po di Goro).** [Malarial Infection in an Interepidemic Period in the Po Delta.]—*Policlinico.* Sez. Med. 1924. May 1. Vol. 31. No. 5. pp. 268–279. [9 refs.]

Of 106 school children in good health, aged from 6 to 10, examined presumably in thin smear, in December, January, March and May, the percentages found infected were respectively 42, 20, 28 and 39. From 83 to 95 per cent. of these showed schizonts, although without fever.

C. L.

SINTON (J. A.) & BAILY (J. D.). **The Occurrence of "Acidosis" in Cases of Malarial Fever.**—*Indian Jl. Med. Res.* 1924. Apr. Vol. 11. No. 4. pp. 1051–1056. [14 refs.]

The most practical clinical test for acidosis is held to be that of SELLARDS, namely, the administration of bicarbonate of soda in fixed doses at stated intervals, and the noting of the time required to render the urine alkaline to litmus. By giving at once 4 gm. well diluted orally, an hour later 2 gm., and thereafter 2 gm. every half hour, with water copiously between, the urine being passed and tested before the due time for the next dose, it was found that the average amount of the salt required in 53 normal Indians to produce alkalinity was 6·5 gm. In 22 cases of infection with *Plasmodium vivax* it was 13·9 gm. and in 100 with *P. falciparum* 14·5 gm. There is then an acidosis in malaria. None of these cases showed serious symptoms.

C. L.

BOULAY (A.) & BÉDIER (E.). **Accès pernicieux et azotémie.**—*Bull. Soc. Path. Exot.* 1924. Mar. 12. Vol. 17. No. 3. pp. 282–284. [2 refs.]

Following up the work of BENHAMOU and others (this *Bulletin*, vol· 19, p. 291) the writers report 4 fatal cases of malaria with coma. In the first the serum-urea and urine-urea were 2·6 and 5·9 gm. per litre; in the second no urine was passed in 12 hours, the serum urea-content being 1·08; in the third the urine contained albumin and casts and the serum-urea content was 4·23; in the 4th the urea-content of the serum was 2·4, of the cerebro-spinal fluid 2·12, and the grammes of albumin in the urine per litre 0·4. It is concluded that malarial coma is often uraemic and should be treated as such.

C. L.

figures in subtertian being almost as high as in tertian malaria. This being attributed to insufficient treatment, each patient was given an intravenous injection of nine grains of quinine bihydrochloride dailv until the temperature reached normal as well as two ten-grain doses of the bisulphate also daily. When fever ceased oral administration was increased to thirty grains daily, and after discharge from hospital lessened to ten grains daily for a month. In 1,231 illnesses 2,484 intravenous injections were given, each occupying from 30 to 45 seconds of actual injection time. The pulse was accelerated 5 to 17 beats a minute for not more than three minutes. Tingling, especially of the mouth, ringing in the ears, occasional constriction of the chest with one or two coughs, sometimes vomiting, on two occasions fainting occurred. Against these disadvantages are claimed simplicity, rapidity, powerful action, barbarity minimized, stay in hospital shortened.

C. L.

DIXSON (T. Storie). **A Consideration of Certain Points in the Pathology of Malaria with Consequent Suggestions as to its Treatment.**—*Med. Jl. Australia.* 1924. Jan. 19. 11th Year. Vol. 1. No. 3. pp. 61–63. [7 refs.]

The treatment advised is 3 to 4 grains of quinine hydrochloride in uncoated pill form with three or four ounces of water, four times a day, for two months, and one grain of calomel at night, and a saline draught next morning for a week or two. Whether or not the cases were microscopically diagnosed is unstated.

C. L.

CORDES (Wilhelm). **Ueber den therapeutischen Wert des Cinchonins bei Malaria tropica.** [Therapeutic Value of Cinchonine in Malaria tropica.]—*Arch. f. Schiffs- u. Trop.-Hyg.* 1924. Mar. Vol. 28. No. 3. pp. 120–123. With 2 charts. [9 refs.]

Working under NOCHT and using three half-gramme doses of cinchonine hydrochloride daily, the writer found that ring forms were apt to persist longer and to return more rapidly to the circulation than under the use of five fifth-gramme doses of quinine hydrochloride. Appreciation of the work done on this subject outside Germany is evident.

C. L.

CHOPRA (R. N.), KNOWLES (R.) & GUPTA (J. C.). **On the Failure of *Vitex peduncularis* in the Treatment of Malaria.**—*Indian Med. Gaz.* 1924. Mar. Vol. 59. No. 3. pp. 133–135. With 8 figs. [3 refs.]

Infusion of leaves of *Vitex peduncularis* (this *Bulletin*, Vol. 17, p. 306), supplied to the writers by the courtesy of Col. VAUGHAN at the season when their medicinal efficacy is held to be greatest, was tested in 12 cases, 4 of benign tertian, 6 of subtertian and 3 of quartan malaria (one being a mixed infection). It produced no effect at all upon the malaria parasites whose daily course was noted in blood films. Quinine had to be given, sometimes urgently, to correct symptoms.

C. L.

RUBASCHKIN. **[Vergleichende Bewertung verschiedener Behandlungsmethoden der Malaria mit Chinin.** Comparative Value of Various Methods of Quinine Treatment in Malaria.]—*Kub. Nautschno-Med. Westnik.* 1923. No. 1–4. [Summarized in *Arch. f. Schiffs- u. Trop.-Hyg.* 1924. Apr. Vol. 28. No. 4. p. 171.]

From observation of 600 cases of malaria, of type unstated in the German abstract, it is concluded that in malaria it is immaterial what kind of quinine treatment is used, the dosage having no relation to the rapidity of cure. After 10 to 15 injections 25 per cent. of relapses occurred. Oral combined with subcutanous quinine is advised.

C. L.

DE BUEN (Sadi). **El tratamiento como medida profilactica en la lucha antipaludica.**—*Rev. Méd. de Barcelona.* 1924. Apr. Year 1. Vol. 1. No. 4. pp. 328-342. With 5 figs. [39 refs.]

This paper with its considerable reference to literature other than Spanish must prove valuable in that country. Some cases cited are held to show quinine resistance, evidenced in most cases by persistence of gametes, but without evidence offered of quinine absorption. No case of abortion from quinine has been noted nor any haemoglobinuria. Tertian malaria has relapsed in spite of ten injections of neosalvarsan.

C. L.

BRAHMACHARI (U. N.). **The Difficulties in the Treatment of Malaria and how to combat them.**—*Calcutta Med. Jl.* 1924. Feb. Vol. 18. No. 8. pp. 599–614.

This paper deals mainly with the writer's antihaemolytic treatment and the question of fall in blood-pressure after intravenous injection of quinine (this *Bulletin*, Vol. 18, p. 339 & Vol. 19, p. 864).

C. L.

WOLOGIN & MOREV. **[Treatment of Malaria by Intravenous Injection of Tartar Emetic.]**—*Russian Jl. Trop. Med.* Moscow. 1924. No. 2. pp. 65–68. [In Russian.]

The authors employed a 2 per cent. solution of tartar emetic in doses of 3 to 7 cc., injected intravenously, in 104 cases of benign tertian fever. The best result was obtained by administering the drug from one to three hours before the attack; in 38 cases thus treated the paroxysms ceased in 100 per cent. (52·6 after the first injection, 31·6 after the second, and 15·8 per cent. after the third). In 66 cases treated in other stages of the fever the results were less satisfactory: in 25 per cent. there was response only after the fourth injection, and in some cases after the sixth, while there was none at all in 10 per cent.; relapses occurred in 30 per cent. of the series of 66 cases. The action of the drug on the parasites could be established microscopically. In four cases a quotidian fever was reduced to a simple tertian by the action of tartar emetic, *i.e.*, one generation of the parasite was destroyed.

C. A. Hoare.

LJACHOWEZKI (A. M.). **[Combined Treatment of Malaria by Intravenous Injections of Methylene-Blue and Neosalvarsan.]**—*Russian Jl. Trop. Med.* Moscow. 1924. No. 2. pp. 3–10. [13 refs.]. [In Russian.]

In this paper are recorded the results of combined treatment of malaria by APPEL's method (this *Bulletin*. Vol. 11, p. 29). Among the 53 cases thus treated, the majority were suffering from chronic malaria contracted in the Caucasus or in Bokhara, many of them having been treated unsuccessfully with quinine, and some (8 per cent.). showing an idiosyncrasy towards this drug. All cases were of the benign tertian type, but associated with *P. falciparum* in several, and in one with *P. malariae*. The usual course of treatment was to inject methylene blue (0·2 gm. in 10 cc. aq.) two days in succession, and neosalvarsan (0·45 gm.) four hours after the last dose of the dye; 10 to 12 days later the procedure was repeated. Generally, the parasites disappeared from the peripheral blood 6–8 hours after injection of salvarsan, the spleen and liver diminished to normal dimensions after the second series of injections, and the general condition of the patients improved considerably. Relapses were observed in 18 per cent. of cases as compared with 100 per cent. in cases treated by other methods in the same clinic.

C. A. Hoare.

AVIDON (H.). **Traitement de la malaria par la diurotropineiodobenzométhylée.**—*Ann. Soc. Belge de Méd. Trop.* Brussels. 1924. Jan. Vol. 3. No. 3. pp. 347–352.

Septicaemine is a combination of iodine 33 per cent. with urotropine and benzomethyl. It is given intravenously, intramuscular and subcutaneous injection being very painful. The dosage used is not stated. Results are held to be encouraging.

C. L.

JAARVERSLAG DER MALARIACOMMISSIE VOOR NOORDHOLLAND OVER 1923. [Report on the North Holland Malaria Commission for 1923.] (Uitgebracht aan den Minister van Arbeid, Handel en Nijverheid.) [ALDERSHOFF (H.), Chairman, KORTEWEG (P. C.), Secretary.]—31 pp. With 1 graph. 1924.

Abstracts of previous reports appeared in this *Bulletin* (Vol. 19, pp. 282 and 855 and Vol. 20, p. 962). Some additional new lines of investigation have been pursued. The percentage of female *Anopheles maculatus* found containing blood in the winter months varied in barns from 8 to 12, in animal-houses from 18 to 25, and in dwellings from 5 to 16, the facts supplying further evidence that anopheles feed in winter and that they pass from place to place, since barns are uninhabited. For larval destruction paraffin was spread on water at the rate of from 3·3 to 4 gm. per square metre, but it is felt that in Holland winter destruction of adult females is the most practicable line of attack. Pigsties and stables harbour in Holland more anopheles than do cattle or goat stalls. In the 44 animal-houses which yielded more than 50 anopheles each, the average number caught was 5,600. The percentage of persons giving infected smears has fallen, perhaps an uncertain means of comparison since only those suspected were examined; but at the same time the amount of quinine demanded in various places has fallen steadily, as has the number of reported cases. The United States Standard Treatment is now issued in Holland. Reference is made to CREMONESE's fantastic recommendation of mercury as a cure for malaria (this *Bulletin*, Vol. 15, p. 126), it now transpiring that a letter received by the President of the Dutch Commission from CREMONESE states that his cure takes a super-sabbatical rest from May to September. A crafty mosquito gaining surreptitious access to an experimental Chara tank produced therein a lusty batch of larvae. Reference is made to a visit of SWELLENGREBEL to Italy under the *Echange entre personnels sanitaires à activité spéciale (lutte antimalarique)*, and to that of JAMES to Holland which had happy results.

C. L.

WALCH (E. W.). **De *M. sinensis* als gevaarlijke overbrenger, (een sawah-epidemie).** [*M. sinensis* as a Dangerous Carrier (A Sawah Epidemic).]—*Geneesk. Tijsdchr. v. Nederl.-Indië.* 1924. Vol. 64. No. 1. pp. 1–27. With 5 figs. [English Summary pp. 26–27.] [9 refs.]

Two malaria epidemics have occurred within four years, the insect host concerned being *Anopheles sinensis* alone in one, but accompanied in the other by other species. The percentage of infection discovered establishes a record for the species, namely 20 per cent. over a period of two weeks and 12 per cent. over three months in 3,600 females dissected. The variety *vanus* was present. A treatment of 8 to 12 weeks, given as associated with the names of Ross and BASS, is approved. Properly supervised treatment was effective. Buffaloes were adequate counter-attractions to man, provided they were presented to the anopheles in the proportion of at least 1 to 20. So proportioned, there were caught on two buffaloes 1,026 mosquitoes in two months, hardly any being caught in adjacent houses. The starting of rice culture where such a mosquito as *A. sinensis* exists is deprecated except under medical supervision.

C. L.

STRICKLAND (C.). **Malaria on Ambootia Tea Estate near Kurseong and the Success of some Anti-Malarial Operations.**—*Indian Med. Gaz.* 1924. Mar. Vol. 59. No. 3. pp. 119–121. With 7 charts. [4 refs.]

Lying in the Eastern Himalayas at about 3,000 feet altitude, with porous soil consisting of decomposed micaceous granite, this Estate was held, on consideration of the relations of malaria to rainfall, to owe its malaria to the swamp-breeders *Anopheles willmori*, *A. maculatus* and *A. aitkeni*. Drainage of swamps and training of streams has been followed by reduction of the malaria rate.

C. L.

HECKENROTH (F.). **A propos des vœux de la Société Medico-chirurgicale relatifs à la lutte antipaludéenne à Dakar.**—*Bull. Soc. Path. Exot.* 1924. Jan. 9. Vol. 17. No. 1. pp. 103–104.

Under the Law, and apart from epidemics, executive hygienic action can take effect only after judicial proof of disregard of the regulations, and can even then be subjected to vexatious delays here pointed out. It is suggested that the regulations may be so altered that evasion by delay may be shortened.

C. L.

FOUCAR (F. H.). **Malaria Survey in a Citizens' Military Training Camp.**—*Milit. Surgeon.* 1924. May. Vol. 54. No. 5. pp. 542–544. With 1 chart in text.

A Kansas regiment in which no malaria had been detected was in camp with two other infected regiments. Two cases occurred in the Kansas regiment, and 13 more in the other two.

C. L.

CATANEI (A.). **Essai critique sur la morphologie des parasites du paludisme.** —*Arch. Inst. Pasteur d' Algérie.* 1923. Vol. 1. No. 1. pp. 10–108. With 3 plates. [59 refs]

Most of the facts here concerned have already been considered (this *Bulletin,* Vol. 19, p. 575). The conclusions now formed are that the text-book descriptions of the three ordinary forms are not sufficiently elastic, that there occur in each case nonconforming individuals, and that *Plasmodium africanum, P. tenue, P. caucasicum* and *P. minutum* represent aggregations of these transition forms. It will be remembered that the man was infected with all three types of malaria, and it is now affirmed that *P. tenue* stages are to be attributed both to *P. vivax* and *P. falciparum.* Morphological variations of the parasites are held to be determined by variations in the blood, and by the absence of quinine treatment; so that the curious conclusion, to which this particular leaning towards the unicity theory must lead, is that it is quinine which keeps the three common forms of parasite true to type.

C. L.

STEPHENS (J. W. W.). **Some Morphological Features of** *Plasmodium falciparum.*—*Ann. Trop. Med. & Parasit.* 1924. Apr. 30. Vol. 18. No. 1. pp. 33–35. With 2 plates.

It is impossible to consider this paper satisfactorily apart from its plates, which in the copy seen are incorrectly numbered. They illustrate many anomalous forms occurring in films from a West African case. They are classed in the paper as those with a cytoplasmic connection between adjacent parasites, those with a similar nuclear connection, symmetrical parasites in double corpuscular infections, and miscellaneous forms.

C. L.

HUCK (John G.) & BOWDEN (David T.). **On the Peculiar Morphology of a Malarial Parasite in a Case of Chronic Malaria in the Temperate Zone.**—*Bull. Johns Hopkins Hospital.* 1924. Apr. Vol. 35. No. 398. pp. 122–126. With 2 plates & 1 chart. [6 refs.]

This paper invites study side by side with that of Stephens. The preparations are from a Maryland negro after receiving his sixth injection of 0·4 gm. of arsphenamin (presumably neosalvarsan) for syphilis, and show these forms :—

About two hours after the chill small rings, occupying a quarter to a half of the corpuscle, rarely vacuoled (?), multiple infection not uncommon : 29 hours after the chill rings filling two-fifths to a half of the corpuscle, chromatin of all shapes occurring and a vacuole being very distinct : 20 to 30 hours after the chill, rings, described as resembling " those seen in infection with *P. malariae* except that the protoplasm was much less narrow and smaller in amount." In the figured specimens it would be better described as a fine lash lying across the corpuscle. Crescents, too, were present in all smears.

C. L.

PEREKROPOW (G.). **Polymorphismus der Parasiten Malariae tertianae. Ueber quartanaähnliche Tertianaparasiten.**—*Rev. Microbiol. et Épidémiol.* Saratov. 1923. Vol. 2. Nos. 3–4. In Russian pp. 71–73. With 1 plate. [6 refs.] German summary p. 108.

Cases occurring in Kazan in 1922–23 showed peculiar forms of *Plasmodium vivax,* resembling the schizonts of quartan malaria as described in one of the textbooks. One may perhaps conclude therefrom the writer's experience has not included personal acquaintance with these forms. Division is described as chaotic. Judging by the summary, the possibility of double infection has not been considered.

C. L.

DARGEIN & LANCELIN. **Un cas d'accès pernicieux palustre.**—*Bull. et Mém. Soc. Méd. Hôpit. de Paris.* 1924. May 22. Year 40. 3rd Ser. Vol. 48. No. 17. pp. 702–707.

A pernicious attack of malaria was accompanied by some *Plasmodium falciparum* in the cutaneous circulation. It cleared up under an intramuscular quinine treatment of unstated intensity. Three weeks later an ordinary frank tertian malaria supervened with *P. vivax* present. Reinfection at Toulon is to be dismissed. It is suggested that the brutal climatic change from Senegal to France in winter produced an artificial seasonal alteration in the parasite.

C. L.

STEPHENS (J. W. W.) & GORDON (R. M.). **The Relative Number of Male and Female Crescents.**—*Ann. Trop. Med. & Parasit.* 1924. Apr. 30. Vol. 18. No. 1. pp. 55–59. [2 refs.]

KNOWLES having given the proportions of male and female crescents as 1 to 10, and ABRAMI and SENEVET as 1 to 1·2 and 1 to 2·3 in two series, Stephens and Gordon examined 10,000 crescents from one case and 1,000 from another and found it to be 1 to 3 in both series.

C. L.

BLACKLOCK (B.) & ADLER (S.). **A Malaria Parasite of the Chimpanzee.**—*Ann. Trop. Med. & Parasit.* 1924. Apr. 30. Vol. 18. No. 1. pp. 1–2. [4 refs.]

A male chimpanzee, three months old, negative to malaria by repeated examinations over six weeks, was injected with 3 cc. of citrated human blood, heavily infected with *Plasmodium falciparum*, two hours and a half after withdrawal. Infection did not follow. In conjunction with BLACKLOCK and ADLER's failure to infect two Europeans from the infected chimpanzee (this *Bulletin*, Vol. 19, p. 588), this is held proof that the forms in the two hosts represent different species, and that of the chimpanzee is designated *Plasmodium reichenowi*.

C. L.

FRONTICELLI (Enrico). **La reazione della uroeritrina per la diagnosi differenziale fra tifo e malaria.**—*Policlinico.* Sez. Prat. 1924. Mar. 10. Vol. 31. No. 10. pp. 313–314.

Two to three cc. of a 5 per cent. solution of neutral acetate of lead added to 5 or 6 cc. of urine containing uroerythrin throw down a rosy precipitate. A white or yellow precipitate does not indicate uroerythrin. The rose colour has always been markedly evident in malaria during fever, absent or very slight in typhoid. In view of the facility of the test compared with the Widal reaction or with the detection of parasites, publication is now made.

C. L.

BALLERSTEDT. **Das Verhalten des Urobilins bei Malaria.** [Behaviour of Urobilin in Malaria.]—*Arch. f. Schiffs- u. Trop.-Hyg.* 1924. Mar. Vol. 28. No. 3. pp. 100–119. [26 refs.]

Excretion of urobilin in urine and faeces runs, in fresh infections, parallel with their severity, lasts for some time, and lessens in staircase fashion. More is excreted by bowel than by kidney. In three latent cases, parasites being present, urobilin was absent. On the other hand, light grades of urobilinuria, without other symptoms, are not evidence of malaria. Neither the species of parasite concerned nor quinine treatment has any appreciable influence on the excretion of urobilin.

C. L.

LIGNAC (G. O. E.). **Over haemoglobinogene pigmenten, het malariapigment in het bijzonder.** [On Haemoglobinogenous Pigments, the Malaria Pigment in Particular.]—*Nederl. Tijdschr. v. Geneesk.* 1923. Dec. 22. Year 67. 2nd Half. No. 25. pp. 2671–2676. With 1 plate. [19 refs.]

Discussion of the various pigments probably derived from haemoglobin, notably of haemosiderin, haematoidin and malarial pigment. One of the most constant characters of these pigments, but not invariably present, is the presence of iron, easily demonstrable in haemosiderin because fixed as an ion, but with more difficulty in haematoidin because directly fixed to an organic radical without ionization. Haematoidin, moreover, may contain calcium. Identity or close relationship with bilirubin is supposed to exist, although not proven, whereas the differences from haematoporphyrin are emphasized in that haematoporphyrin and metals form very complex compounds, the metal being strongly fixed, while in haematoidin or bilirubin, this is not so.

In malaria pigment the difficulty is to show with certainty the presence of iron within the grains of pigment. BROWN and SEYGARTH's method of demonstrating its presence around the grains in the act of being dissolved by ammonium sulphide is held insufficient: the reaction (production of Berlin or Turnbull blue) should take place *inside* the granule. This has been accomplished by Edmund MAYER, who is therefore considered to be the first to demonstrate with certainty the presence of iron in malaria pigment. Lignac has tried, unsuccessfully, to reproduce MAYER's reaction. Without disputing the correctness of the statement, he draws attention to the fact that two of the components necessary for the reaction, viz., potassium ferrocyanide and hydrochloric acid, if remaining too long in contact with each other, will produce Prussian blue without any extraneous iron being present.

Without being able to determine how the malarial pigment disappears from the internal organs, the writer draws attention to the fact, that in a spleen, slate-coloured by the pigment of the subtertian parasite, the ischaemic-necrotic portions are almost free of pigment, which may be due to decolorizing or dissolving influences; also to the fact that the hepatic cells and the malpighian corpuscles never, or almost never, contain malarial pigment.

N. H. Swellengrebel.

VAN NITSEN (R.) & MORTIAUX (C.). **De la valeur de la formule leucocytaire dans la malaria.**—*Ann. Soc. Belge de Méd. Trop.* Brussels. 1924. Jan. Vol. 3. No. 3. pp. 241–251. With 8 text figs. [18 refs.]

—— & ——. **Traitement de la malaria contrôlé par la formule leucocytaire.**—*Ibid.* pp. 253–255. [4 refs.]

Owing to the impossibility of determining by a smear from the cutaneous blood whether malaria has been cured the writers have closely examined the leucocyte formula. A polymorph leucocytosis is confirmed as a feature of an acute attack, and a monocytosis, intensified by quinine, of the ensuing period. But of the mononuclear leucocytes the writers pin their faith on the " transitionals "—larger than the largest polynuclear with horse shoe nuclei, plump, faintly staining. These in Katanga vary in newly arrived non-infected persons from 1 to 5 per cent., in malaria cases they have a mean of 10 to 15 with minima and maxima of 7 and 20. Applying this formula to the results of the American Standard Treatment in 117 cases, 39 per cent. returned to a normal leucocytic formula in 6 weeks, and 91 per cent. in 8 weeks. For the rest the treatment had sometimes to be continued for four and a half months. All those treated also with hectine returned to normal in eight weeks.

C. L.

MEO-COLOMBO (Isabella). **La monocitosi nella malaria.**—*Policlinico.* Sez. Med. 1924. May 1. Vol. 31. No. 5. pp. 255–268. [21 refs.]

The writer describes examinations of ear blood from 9 cases of malaria, one fatal. It is concluded that the number of mononuclears is unaffected by massage of the ear, is increased in subtertian and double tertian infections, augmented during the access and by the administration of quinine, may reach 40 per cent. and is not related to the severity of the fever. These findings are in contradiction to those of LUCEY (this *Bulletin*, Vol. 19, p. 290).

C. L.

STUHLMANN (Walter). [**Die Sedimentierungsgeschwindigkeit der roten Blutkörperchen und im besonderen ihr Verhalten bei der Malaria.**] [The Rate of Sedimentation of the Erythrocytes more particularly as influenced by Malaria.]—1923. Hamburg: L. Friedrichsen & Co., 52 pp. [Summarized in *Arch. f. Schiffs- u. Trop.-Hyg.* 1924. Feb. Vol. 28. No. 2. pp. 76–77.]

The rate at which erythrocytes sink in citrated blood is accelerated in malaria, as in infectious diseases generally. The condition runs in general parallel to the temperature; it is lengthened by administration of quinine, whether this be continuous or intermittent. The drug has also a restraining influence on the bursting of erythrocytes.

C. L.

MIRONESCO (M.). **Démonstration au microscope de coupes de la peau et du nerf optique présentant des lésions et des parasites de la malaria.**—*Bull. et Mém. Soc. Méd. Hôpit. de Bucarest.* 1923. Oct. Vol. 5. No. 8. pp. 134–135.

Erythrocytes extravasated in the skin were not found infected, but the adjacent vessels and those of the optic nerve were packed with malarial parasites.

C. L.

PHOTAKIS (B. A.). **Pathologisch-anatomische Bemerkungen zur Diagnose mancher Formen der Malaria perniciosa.**—*Deut. Med. Woch.* 1924. Apr. 11. Vol. 50. No. 15. p. 465. [2 refs.]

Pathologically characteristic of malaria is a chocolate-brown or even black colouration of the marrow of the long bones, held evidential of regeneration of erythrocytes.

C. L.

HEINEMANN i. (H.). **Untersuchungen ueber den Liquor cerebrospinalis. I. Mitteilung. Der Liquor cerebrospinalis Malariakranker.** ii. **II. Mitteilung.**—*Arch. f. Schiffs- u. Trop.-Hyg.* 1924. Jan. & May. Vol. 28. Nos. 1 & 5. pp. 26–32; 187–193.

i. Examination of cerebrospinal fluid from 106 Javans with subtertian, 27 with tertian, 4 with quartan, and 13 with chronic malaria and no parasites found, leads to the conclusion that malaria is not a source of error in the tests of Wassermann as modified by HAUPTMANN, and by the third modification of Meinicke's reaction, the blood in each case being taken during an attack.

ii. Investigation into these points in another 100 Javans confirms the first findings. These negative findings in 14 cases of definite implication of the nervous system lead to the conclusion that in these people malaria produces no alteration of the cerebrospinal fluid.

C.L.

BUSINCO (A.) & FOLTZ (P.). **Sifilide e malaria. ¿Valore degli esami biologici.**—*Policlinico.* Sez. Med. 1924. May 1. Vol. 31. No. 5. pp. 245–255. [36 refs.]

Work on 19 cases of tertian, 22 of subtertian, 4 of quartan and 4 of chronic malaria without parasites leads to the conclusion that the biological methods of Wassermann, Sachs-Georgi and Meinicke (the first carried out with ox and guineapig heart, congenital syphilitic extract and malarial spleen) used for the diagnosis of syphilis have no useful place in the diagnosis of malaria. Weak deviation reactions found in 11 per cent. of malarias are held non-specific, and some 8 per cent. of febrile malarial sera are held autodeviant.

C. L.

MARCIALIS (G.). **La reazione di Wassermann e di Sachs-Georgi nella malaria.**—*Gazz. d. Osped. e d. Clin.* 1924. Jan. 27. Vol. 45. No. 4. pp. 75–80. [44 refs.]

In 225 cases investigated, comprising 44 tertian, 58 quartan, 71 subtertian and 52 in which no parasites were found (40 of these being classed as chronic malaria and 12 as malarial cachexia), it transpired that in apyrexial periods no Wassermann reaction was produced, but that during fever a slight reaction was occasionally detected, irrespective of the presence, kind, and number of parasites evident in the peripheral blood. The Sachs-Georgi reaction, using the thermostat, gave generally corresponding results. Injection of quinine, or its admixture in vitro, did not alter the reaction.

C. L.

MÜHLENS (P.). **Ueber Gefahren bei der Fieberbehandlung der Paralyse.** [Risks attending the Malarial Fever Treatment of Paralysis.]—*Klin. Woch.* 1923. Dec. 24. Vol. 2. No. 52. pp. 2340–2341. [3 refs.]

Professor Mühlens issues a very weighty warning regarding the care which must be exercised when a malarial strain is being initiated for the treatment of general paralysis. The Institute must be free from bugs, lice, and anopheles; injection is to be given only to strong individuals; before injection be satisfied that quinine agrees with the individual; after injection examine the blood daily; give quinine immediately if the number of parasites become excessive, or if icterus or prostration supervene; do not let the patient leave the institution until he has been free from parasites for 3 or 4 weeks; use benign tertian only; in the making of a strain watch carefully for subtertian contamination.

C. L.

BRITISH MEDICAL JOURNAL. 1924. Mar. 15. p. 479.—**Treatment of General Paralysis by Malaria. [Statement by the Board of Control.]**

The circular letter notes that when direct inoculation with malaria was introduced into England it was hoped that the infection would be of a mild non-relapsing type with parasites so sparse that mosquito infection would not occur. It is suggested that the severity which has, in fact, characterized these inoculations with *Plasmodium vivax,* depends in part on its tropical source, in part on an increase instead of a decrease of virulence resulting from continued direct inoculation. [The literature does not now seem to support either of these conclusions]. Parasite relapses, it is stated, have occurred, and *Anopheles maculipennis* has been freely infected. Accordingly, Institution officers, and others concerned, are instructed that blood examinations must be made at least daily, so that mixed or excessive infections may be detected, that infected cases must be adequately screened, and that on their discharge from institutions the Medical Officer of Health must be notified.

C. L.

MÜHLENS (P.) & KIRSCHBAUM (W.). **Weitere parasitologische Beobachtungen bei künstlichen Malariainfektionen von Paralytikern.** [Further Parasitological Observations on Artificial Malaria Infections in Paralytics.]—*Arch. f. Schiffs- u. Trop.-Hyg.* 1924. Apr. Vol. 28. No. 4. pp. 131–144. With 5 figs. [7 refs.]

A summary of the writers' outstanding work. Infection can be carried by the intravenous injection of 0·5 to 2 cc. and by subcutaneous injection of 2 to 4 cc. of malarial blood. Next day a rise in temperature to 38·5° C. (101·3° F.) may occur. Malarial blood can be sent by post without any preservative (temperature 5° to 20° C.) and will yet be effective 24 hours after extraction. Drawn blood has produced infection after standing on ice at a temperature of 3° C. for 12 to 75 hours. Infection will not be transmitted by blood from leeches kept at 20° C. for 48 hours, nor by a blood and dextrose mixture kept for the same time at 37° C. It is necessary to ensure by constant microscopic control that a new strain is pure, and that any strain is under control. Death has followed omission of these precautions. Incubation is shortest after intravenous injection, lying generally between 3 and 12 days, in one quartan case, however, running to 50 days; but two patients injected at the same time with the same quantity of the same blood may have very varying incubation periods; moreover, a single tertian injected may result in a double tertian fever, and *vice versa.*

Fever is often irregular and subjective symptoms mild, though the multitude of parasites and of pigment, free and included, may demand treatment. The spleen is usually not palpable unless in a reinfection. Blackwater fever has not been seen, but three cases have bled profusely from the bowel, two fatally. Throughout 40 direct passages from man to man, throughout collateral infections which raise the total infected to 183, and throughout all seasons from 1922 to 1924 the tertian strain used has remained loyally true to type, with no subservience to unicity. In subtertian cases sporulating and full-grown forms are commoner than in nature. Exflagellation occurred readily after the fortieth direct transfer, and gametes have appeared in all strains of all three parasites used.

In subtertian cases *tenue* forms have been found in many smears. Complete sterilization by quinine is in these cases rapid and easy; reinfection is difficult to produce and spontaneous cure has occurred. The treatment advised is 0·75 to 1 gm. of quinine daily for 3 to 5 days, the first dose being intramuscular, five days' pause and like doses two or three times daily for two consecutive days. Larger doses may do more harm than good. Tertian blood defibrinated and mixed with an equal quantity of a 1 in 5,000 solution of quinine hydrochloride is infective twelve hours later. If the strength of the quinine be doubled, infection is still possible after five hours. Quinine is accordingly held to act by some influence on the natural defensive mechanism.

C. L.

DATTNER (Bernhard) & KAUDERS (Otto). **Klinische und experimentelle Studien zur therapeutischen Impf-Malaria.** [Clinical and Experimental Studies on Therapeutical Infection with Malaria.] 1924. Leipzig & Vienna: Franz Deuticke. 39 pp.—[Reviewed in *Brit. Med. Jl.* 1924. Mar. 1. p. 392.]

Only vigorous patients are strong enough to stand the number of malarial attacks necessary to produce nervous improvement. Infection was ordinarily produced by subcutaneous injection of 2 to 4 cc. of blood, just withdrawn from the donor's vein, into the recipient's back, the remnant of blood being placed upon a scarification overlying the site of injection; intravenous and subcutaneous injections and scarification were each employed alone. Incubation periods were from 4 to 7 days after intravenous, 6 to 10 after subcutaneous injections, and 10 to 18 after scarification. The febrile attacks were milder and the detected parasites fewer than in anopheles-infected cases. Eight, ten, or, if possible, twelve, attacks were permitted, and might be complicated by vomiting, diarrhoea or jaundice. Splenic enlargement was usually absent. Cure was effected by 5 gm. of quinine sulphate spread over 7 days, namely 0·5 gm. twice daily for 3 days and then once daily for 4 more days. Six weekly salvarsan injections were also given for their reputed antimalarial action.

C. L.

HERRMANN (G.). **Jahresbericht ueber die Malariabehandlung der progressiven Paralyse an der Deutschen Psychiatrischen Klinik in Prag im Jahre 1923.** [Malarial Treatment of G. P. in Prague.]—*Med. Klin.* 1924. Apr. 6. Vol. 20. No. 14. pp. 445–448. [7 refs.]

Infection was presumably by *Plasmodium vivax.* It was passed in direct descent by injection through 20 persons. Its virulence greatly increased in the 19th and 20th passage, axillary temperatures running to 41·5° C. (106·7° F.), excruciating pains, vomiting, and, in one case collapse, occurring, so that quinine had to be administered prematurely. The drug's extreme efficacy is noted. In one case 0·5 gm. caused temporary cure, observation being cut short in 6 days by the institution of NOCHT's regime. In another instance 0·25 gm. gave remission for 8 days. In 3 cases fever spontaneously disappeared; irrespective of this two of them were given Nocht's cure; the third, untreated, remained clinically cured during an observed term of 4 months. In one case vision was lost under malaria and was recovered under quinine. In a tabetic case gangrene of the toes ensued during the fever and ceased under quinine.

C. L.

REDLICH (Emil). **Ueber larvierte Malaria nach Malariabehandlung bei progressiver Paralyse nebst Bemerkungen ueber einen möglichen Zusammenhang zwischen Epilepsie und Malaria.** [Masked Malaria after Malarial Treatment of G. P.]—*Wien. Klin. Woch.* 1924. Feb. 7. Vol. 37. No. 6. pp. 134–138. [13 refs.]

A woman of 49 with general paralysis was injected with tertian malaria, and had her first rigor 7 days later. Five more followed on alternate days. During fever she became delirious or unconscious, the temperature reaching 41·2°C. (106·2°F.). She was then treated with 5 gm. of quinine sulphate, namely half a gram twice daily for 3 days and once a day for 4, with a single injection of 0·3 gm. of neosalvarsan. A cataleptic condition appearing on alternate days, blood examination was made and rings discovered. This constitutes the first occasion on which these small doses have failed to cure injected malaria in this clinic. The possible causal relationship of malaria towards epilepsy is discussed.

C. L.

GERSTMANN (Josef). **Ueber den jetzigen Stand der Malariatherapie der progressiven Paralyse, mit besonderer Berücksichtigung neuerer Erfahrungen.**—*Ztschr. f. d. ges. Neurol. u. Psychiat.* 1923. Vol. 81. pp. 255-262. [4 refs.]

This paper considers the matter essentially from the neurologist's aspect. In benign tertian malaria conveyed by injection, quinine in unstated doses produced complete and lasting cure. Passages through 58 men produced no alteration in the virulence, incubation period, or type of fever.

C. L.

UNTERSTEINER (Raimund). **Erfahrungen ueber die Malariabehandlung der progressiven Paralyse.**—*Wien. Klin. Woch.* 1924. May 15. Vol. 37. No. 20. pp. 499–500.

SCHILDER (Paul). **Zur Psychologie und Klinik malariabehandelter Paralysen.**—*Ibid.* pp. 500–501.

These papers have little interest for the malariologist. It is noted in the first that after subcutaneous infection the incubation period varied from 2 to 14 days with an average of 7. A temperature of 41°C. was reached. The first cases were frankly tertian, later ones anomalous. Two of 40 were infected only at the second injection. One died apparently as the result of the malaria, two others of sepsis subsequently acquired, with the impression left that malaria had hastened their ends.

C. L.

i. RUDOLF (G. de M.). **Malarial Treatment of General Paralysis.** [Correspondence.]—*Lancet.* 1924. June 7. p. 1183.

ii. SCHWARTZ. **Erkrankung eines Syphilitikers an Paralyse trotz überstandener Malaria.**—*Muench. Med. Woch.* 1924. May 9. Vol. 71. No. 19. p. 618.

iii. BERCOVITZ (Nathaniel). **Neurosyphilis and Malaria.** [Correspondence.]—*Jl. Amer. Med. Assoc.* 1924. May 24. Vol. 82. No. 21. pp. 1713–1714.

i. The need for the publication of pathological reports on patients who, improving after malarial injection for general paralysis of the insane, have died of some intercurrent disease is urged.

ii. About 15 years ago a man acquired syphilis. In August 1918 he became infected with tertian malaria. In October 1923 evidence of general paralysis of the insane became marked.

iii. Extensive experience in Hainan has proved the general infection with malaria, the coexistence of malaria and syphilis, and the remarkable absence of general paralysis and tabes.

C. L.

GRASSI (Battista); ROSS (Ronald); GRASSI (Battista). **The Transmission of Human Malaria.** [Correspondence.]—*Nature.* 1924. Mar. 1, 8 & 29. Vol. 113. Nos. 2835, 2836 & 2839. pp. 304–307; 353; 458. [2 refs.]

ECKSTEIN (Fritz). **Zur Entdeckungsgeschichte der Malaria. Eine historisch-entomologische Studie.** [History of the Malaria Transmission Discovery.]—*Zoologischen Anzeiger.* Vol. 58. 40 pp. [1 ref.]

The following quotations from the recently reopened discussion as to who proved the transmission of human malaria seem to contain the essentials of the matter.

Grassi in *Nature,* 1924, March 1, p. 305. " Before I published my 'Nota Preliminare' of September 29 [1898] Ross had discovered in the 'grey mosquito' the cycle of development of a parasite of sparrows (*Proteosoma grassii* Labbé), which I had previously shown to be very similar to the parasite of human malaria, and he had illustrated the subject in an extensive memoir. The indication of the sporozoites in the salivary glands was alone wanting; but even this was added by him a few days after the issue of my Nota preliminare (*i.e.* on October 11th, 1898). Naturally this fundamental discovery of Ross simplified the second part of my labour."

Ross, in his " Memoirs," p. 309. " Thus the great victory was won at last. It gave simultaneously two important advances in knowledge. *Zoologically,* the case of *Proteosoma relicta* was the first one in which the great law of Metaxeny or Alternation of Host was proved to apply to unicellular parasites. . . ." And again, p. 333, from a letter to MANSON, dated 31st October, 1898. " You must not trouble yourself in the least about obtaining confirmation of my mosquito work. Before another year has passed there will be dozens of workers all over the world. There is really no difficulty at all *except finding the right hosts* for each species of parasite."

Grassi and collaborators, in a preliminary note on the cultivation of malarial crescents of man in *A. claviger,* Fabr., presented to the Reale Accademia dei Lincei. 28th November, 1898. Translated in Ross's " Memoirs," p. 349. " As the first result of our researches we can announce that we have been able to follow with all certainty certain phases of the development of the semilunar bodies in the thickness of the middle intestine of several *Anopheles claviger* kept at a favourable temperature, which we have made to suck the blood of individuals affected with the summer-autumn form of malaria. The most notable phases in question find a comparison in those discovered by Ross (2nd and 3rd day) for the proteosoma (haemamoeba) of birds."

Grassi, in *Nature*, 1st March, 1924. " By following in my own way I discovered—partly in collaboration with Bignami and Bastianelli—that Anopheles transmits human malaria."

C. L.

i. ADAM. **Au sujet de l'insolubilité de certains comprimés de quinine.**—*Bull. Soc. Path. Exot.* 1924. Jan. 9. Vol. 17. No. 1. p. 93.

ii. DE FREITAS (Otto Marques). **Um caso clinico de myelite aguda palustre curado com injecções de " Paludan."** [Correspondence.]—*Brazil-Medico.* 1924. May 10. Year 38. Vol. 1. No. 19. p. 269.

iii. MACARTHUR (W. P.). **Treatment of Malaria.** [Correspondence.]—*Jl. Roy. Army Med. Corps.* 1924. June. Vol. 42. No. 6. pp. 470–471.

iv. RUBASCHKIN. **[Jod und Jodchinin in der Therapie der Malaria.]**—*Wratschebnoje Djelo.* 1923. No. 3–5. [Summarized in *Arch. f. Schiffs- u. Trop. -Hyg.* 1924. Apr. Vol. 28. No. 4. p. 171.]

v. GALDI (Francesco). **Malaria e diabete.**—*Riforma Med.* 1923. Oct. 15. Vol. 39. No. 42. pp. 988–991. [18 refs.]

vi. URCHS (O.). **Zur Differentialdiagnose der Malaria.**—*Arch. f. Schiffs- u. Trop.-Hyg.* 1924. Feb. Vol. 28. No. 2. pp. 71–73.

vii. YAGI (Kinnojo). **On the Necrotomy of a Case of Latent Malaria complicated by Salvarsan Toxicosis.**—*Taiwan Igakkai Zasshi.* (*Jl. Med. Assoc. Formosa*). 1924. Mar. No. 233. p. 7.

i. A European woman passed per anum during three weeks white bodies which proved to be tablets of quinine hydrochloride of 0·25 gm. each, one of which she had regularly been taking daily.

ii. An acute fever with intense spinal pains passing down to the lower limbs disappeared under treatment with Sedol and Paludan; threatened to return, and was mastered by the same treatment. The diagnosis was clinical. Paludan apparently contains quinine.

iii. A foreign, much vanted, proprietary pill analysed at the Royal Army Medical College contains acid sulphate of quinine some 60 per cent., citrate of iron 25 per cent. and arsenic, reckoned as oxide, 9·13 per cent.

iv. On experience of 20 cases these remedies are advised for malaria not yielding to quinine.

v. As diabetes may follow typhoid, influenza and other illnesses, so, it is held, may it follow malaria. It is noted that no figures can be offered on the matter.

vi. In a malarial country the condition of the spleen and blood must be determined before a diagnosis of perforated appendix is admissible.

vii. In one who had been free from attacks of malaria for seven years, a third injection of salvarsan (the total equalling 1·25 gm.) was followed by death from " neurorecidives " and encephalitis lethargica with post-mortem evidences (not specified in the abstract) accordant with death from malarial coma.

C. L.

ACQUA (C.). **Bonifichiamo le zone malariche col piantamento dei gelsi.**—*Bol. d. R. Stazione Sperim. d. Gelsicoltura e Bachicoltura d. Ascoli Piceno.* 1923. Oct. 1. Vol. 2. No. 5. pp. 236-239. [1 ref.]

BARDACHZI (F.). **[The Treatment of Chronic Malaria.]**—*Wien. Arch. f. inn. Med.* 1923. Oct. 20. p. 51. [Summarized in *Brit. Med. Jl.* 1924. Jan. 12. (Epitome) p. 5.]

BRAS DE SÁ (Luis José). **A profilaxia da malária na Velha Cidade.**—*Bol. Geral Med. e Farmacia.* Bastora. 1922. Jan.–Dec. 8th Ser. Nos. 1–12. pp. 6–7.

ESCOMEL (Edmundo). **A propósito tratamiento del paludismo. Trabajo presentado en la III. Conferencia Sud Americana de Patologia, Microbiologia e Higiene reunida en Montevideo.**—*Cronica Méd.* 1923. May. Vol. 40. No. 719. pp. 167-171.

GRANT (A. R.) & SILVERSTON (J. D.). **Malaria Therapy in General Paralysis of the Insane.**—*Lancet.* 1924. Mar. 15. pp. 540-543. With 4 charts. [2 refs.]

MARINESCO (G.) & DRAGANESCO (State). **Influence nocive du néosalvarsan sur les sujets atteints de syphilis et de malaria. Contribution à l'étude des lésions histologiques des centres nerveux dans la malaria comateuse.**—*C.R. Soc. Biol.* 1924. Mar. 21. Vol. 90. No. 10. pp. 707–711. With 1 fig [*ante* p. 301]. [3 refs.]

MARTINI (E.). **Ueber den augenblicklichen Stand der Malariaverbreitung in Deutschland, ihre Bedeutung und Prophylaxe.**—*Klin. Woch.* 1924. Jan. 1. Vol. 3. No.. 1. pp. 26–30. [55 refs.]

PONTANO (Tommaso). **Sulla riproduzione sperimentale della Malaria per mezzo dei gameti.**—*Policlinico.* Sez. Med. 1923. June 1. Vol. 30. No. 6. pp. 269–287. With 4 charts. [17 refs.] [See this *Bulletin*, Vol. 17, p. 298, and Vol. 20, p. 774.]

DE SEQUEIRA NAZARÉ (Francisco Xavier). **A proposito da epidemia palustre das Fontainhas.**—*Bol. Geral. Med. e Farmacia.* Bastora. 1922. Jan.–Dec. 8th Ser. Nos. 1–12. pp. 7-11.

VARGAS (Martinez). **Paludismo cronico en una niña. La quinina y el arsenico.**—*La Med. de los Niños.* Barcelona. 1922. June. Vol. 23. No. 270. pp. 161–163.

TROPICAL DERMATOLOGY.

OTA (Masao) & LANGERON (Maurice). **Nouvelle classification des dermatophytes.**—*Ann. Parasit. Humaine et Comparée.* Paris. 1923. Oct. Vol. 1. No. 4. pp. 305–336. With 8 figs. [43 refs.]

Comparative studies of some fifty species of dermatophytes from authentic sources, belonging to the five genera usually recognised, namely, *Trichophyton*, *Microsporum*, *Achorion*, *Endodermophyton*, and *Epidermophyton*, have recently been made by one of the authors. It is stated that the existing classification of the dermatophytes into these five genera is not based on their mycological characters so much as on the nature of the lesions which they produce and is, therefore, botanically unsound. Numerous examples are cited in support of this view, which is one with which most mycologists will agree. Thus, morphologically, the *Trichophyton gypseum* group is stated to be much more closely allied to *Microsporum* than to most other species of *Trichophyton*; *Achorion annulosum* is nearer to *Trichophyton violaceum* than to *A. schönleini*; *A. gypseum* resembles the animal species of *Microsporum*; *Epidermophyton rubrum* is related to *T. gypseum* more nearly than to *E. cruris*; and so on. In reality, no morphological characters of weight serve to differentiate the five genera as at present recognised: all have approximately similar mycelial and chlamydospore characters; most have the peculiar type of lateral spore termed an "aleurie" by VUILLEMIN; and even the fusiform, pluricellular spores, which are perhaps the most characteristic feature of certain species, have been discovered in more or less perfect shape by the authors in *Achorion schönleini* and other forms in which they were not previously known to occur.

It is concluded that the dermatophytes form a homogeneous group, which is classed amongst the Hyphomycetes without prejudice to the possibility of their being conidial stages of Gymnoascaceae. Indeed, in view of the known production of skin lesions of the ringworm type by one of the latter family, *Eidamella spinosa*, and the formation of Gymnoascaceous perithecia in *Trichophyton currii*, this latter possibility is worthy of all consideration. It is supported by the authors' statement that *Gymnoascus reesii* has aleuria and fusiform spores of the same nature as those of *Trichophyton*, as well as by the occurrence of denticulate and spirally-coiled hyphae in several of the conidial dermatophytes.

The morphological characters of the mycelium and organs of dissemination are clearly described and illustrated. The mycelium is colourless or tinted reddish or violet. As is well known it has little taxonomic value, forms similar to those figured being found in many different groups of fungi: even the "nodular organs," which the authors are inclined to regard as rudimentary attempts at perithecium-formation, have, perhaps, no more significance than the mycelial "bulbils" found in other groups. The same is true of the so-called *Endoconidium*-type of conidia and the "arthrospores," which are merely oidia, chlamydospores, and resting or budding cells of the mycelium, similar to those known in many fungi. Possibly too much attention has been paid to these structures in the dermatophytes as a whole, and it can serve no useful purpose to dwell on them. The main organs of reproduction are the aleuria—unicellular, lateral conidia said to be usually liberated by the dissolution of the stalks connecting them to the hyphae—and the fusiform spores, regarded as pluricellular chlamydospores. One may be permitted to doubt whether any of these structures have the morphological value of true conidia or whether they are not all merely of chlamydospore rank.

In view of the absence of clearly marked spore characters it is obviously far from easy to divide the mass of the dermatophytes into separate genera. Nevertheless the authors unite them into a separate subfamily of the Hyphomycetes which they term Closterosporeae, and then proceed to a new subdivision into six genera. It would surely have been more logically in accordance with their own observations regarding the scantiness of distinguishing morphological characters within the group to have united all into a single genus. The subfamily itself has little to commend it except as defining the essential unity of the dermatophytes. Of the older genera three are retained in an amended form, *Trichophyton, Endodermophyton,* and *Epidermophyton,* with the loss of certain of their species transferred to the other genera. Three new genera are created for the remaining forms. *Sabouraudites* contains the species co-generic with *Microsporum audouini,* Gruby (1843), and should by all the laws of nomenclature retain GRUBY'S generic name, notwithstanding that subsequent species have been wrongly placed in the genus. *Grubyella* is based on the forms co-generic with *Achorion schönleini,* Lebert (1845), and is an equally unnecessary creation. *Bodinia* is based on the type *B. violacea* (*Trichophyton violaceum,* Bodin, 1902) and is characterised by the general absence of any spore forms other than arthrospores (chlamydospores) in chains, though aleuria of a rudimentary type are occasionally formed.

With the views expressed in the earlier part of this paper one can have nothing but agreement. In the revised classification offered, however, it would seem that a golden opportunity has been lost of giving concrete form to these views by abolishing the artificial distinctions between the genera of earlier writers. Such a course might have done something to check the genus- and species-mongering that is the bane of medical mycology.

E. J. Butler.

SABOURAUD (R.). **Sur la classification botanique des dermatophytes.** — *Ann. Parasit. Humaine et Comparée.* Paris. 1924. Apr. Vol. 2. No. 2. pp. 172–177.

Discussing the recently published classification of the dermatophytes by OTA and LANGERON [see above] Sabouraud expresses his complete agreement with the view that all these organisms are closely related to one another and form a homogeneous botanical group. He also agrees that previous classifications had no more than a provisional value, based chiefly on clinical expediency. He is unable to accept, however, the method proposed by the authors in order to establish the morphological characters of the various dermatophytes, namely, their culture on a single type medium. He argues very truly that in the case of organisms such as these, admittedly particular in their nutrient requirements and often difficult to obtain in a freely-sporing form, the choice of a single medium is scarcely likely always to yield cultures in a full state of morphological differentiation. For a true botanical classification the organisms should be studied in the most fully differentiated condition, that is to say under optimum conditions for growth and sporing. In the absence of any such attempt he prefers to adhere to the present clinical classifications. From his long experience of the dermatophytes he has come to certain conclusions as to the botany of these fungi. He considers that the human species of *Microsporum*, the animal species of the same genus, and the microid species of *Trichophyton*, form three sub-genera, but that certain other dermatophytes, *e.g.*, *Epidermophyton inguinale*, seem to belong to a distinct genus though still within the close family circle of the group.

E. J. Butler.

LOMBARDO (C.). **Di una particolare colorazione vitale di alcune dermatomiceti.** [Vital Staining of Dermatomycetes.]—*Giorn. Ital. Malattie veneree e della pelle.* 1923. Vol. 64. No. 2. pp. 720–721.

Application of chrysarobin to conditions of dermatomycosis causes a fairly definite staining of the tissues in 24 hours, becoming more intense later. Sections, after being washed in benzol and cleared in cedar oil, show the protoplasm of the fungi coloured a deep brown, owing, it is said, to oxidizing ferments in the fungi themselves. The author suggests the use of this process both for demonstration and identification of dermatophyta.

H. Harold Scott.

DE MAGALHAES (Octavio). **Apropos des teignes observées au Rio Grande do Sul (Brésil),** *Microsporum circuluscentrum.*—*C.R. Soc. Biol.* 1924. Jan. 18. Vol. 90. No. 1. pp. 53–55. With 2 figs.

Report of a case of T. tonsurans occurring in a child aged 18 months. Microscopical examination revealed a fungus in sparse amount with the appearance and arrangement of a microsporum. The cultures showed a concentric ringed formation of white, yellow and ash-coloured growth arranged excentrically about a raised snow-white downy central portion, the whole culture having an external white rayed border. In some cultures the yellow tint predominated to resemble the culture of *M. fulvum.* The microscopical appearances of the cultured fungus are described ; the absence of " fuseaux " is emphasized.

W. Jenkins Oliver.

HORTA (Parreiras). **Uma nova tinha microsporica Brazileira.** *Microsporon Ramos*, **n. sp. (Nota previa).** [A New Species of Microsporon in Brazil].—*Brazil-Medico.* 1924. Feb. 2. Year 38. Vol. 1. No. 5. pp. 59–60.

Mention is made of three cases exhibiting a favus-like eruption of the hairy scalp, one of which was complicated by a pustular folliculitis. Growth of a microsporon was obtained on Sabouraud's saccharose medium. A yellow pigment was first produced in the culture and later a red pigment limited to the zone of growth and penetrating the medium. In some respects the organism resembled *M. ferrugineum*, but differed in the following points :—(1) The colour ; (2) *M. ferrugineum* shows no external spores, whereas they were abundant in the new species ; (3) Whereas *M. ferrugineum* resembles in culture *Achorion schönleini*, this resembles *M. equinum.* The author names the new species *M. Ramos* in honour of his colleague, Dr. João RAMOS E SILVA. A more detailed account with photographs is to appear later.

H. Harold Scott.

CARINI (A.). **Sur la dermatite verruqueuse.**—*Bull. Soc. Path. Exot.* 1924. Mar. 12. Vol. 17. No. 3. pp. 227–233. With 1 plate & 3 figs. [11 refs.]

Two cases of this dermatomycosis are reported from Brazil, of which the diagnosis of the first is based entirely on photographs of the affected area. The lesions of the second case were situated about the external malleolus and dorsum of the right foot, and consisted of papillomatous tumours raised 1–2 cm. above the skin surface covered with adherent thick crusts. Such papillomatous lesions, according to the patient, had developed from nodules of which type one was visible and was soft, fluctuating and contained pus. The affection dated from 16–17 years previously. All forms of treatment, including iodide of potassium, were without result. The pus on examination showed round and oval elements, 8–15μ in diameter, with a thick brown-coloured capsule. In addition there were distinguished occasional short mycelial filaments. Histologically the tumour resembled a granuloma with diffuse infiltration. The cultural characteristics are described. Probably the fungus had a saprophytic existence in the soil and became pathogenic through accidental inoculation of the skin. The fungus isolated from this case has not been identified. From previous cases reported two kinds of fungus had been denominated, *Phyalophora verrucosa* and *Acrotheca* respectively. The differential diagnosis is briefly discussed.

W. J. O.

LEÃO (A. E. Arêa). **Chromoblastomycose (Dermatite verrucosa mycotica. Observação de um novo caso).**—*Sciencia Medica.* Rio de Janeiro. 1923. Nov. 30. Vol. 1. No. 5. pp. 227–228. With 1 plate.

This is an account of a patient suffering from " Chromoblastomycosis " or verrucose dermatitis due to *Acrotheca pedrosoi,* differing from one previously recorded in which the condition was associated with dermal leishmaniasis.

A man, 63 years of age, resident for the past 15 years in S. Paulo, a labourer on the coffee plantations, where he worked barefoot: 12 years ago a single nodule developed on the left foot which increased from time to time till 3 years ago, when several fresh lesions appeared involving the whole foot, dorsal and plantar aspects, and the lower part of the leg. Each of these latter lesions was 1–3 cm. in diameter, with a distinct edge, raised, verrucose, crusted, reddish in colour, and exuding a blood-stained, seropurulent discharge. One larger lesion, 10 cm. in diameter, was present on the outer aspect of the leg at the junction of the upper and middle thirds. The patient was unable to walk on account of the pain. Sections showed a growth of the fungus Acrotheca and giant cell formation, while cultures made from material obtained by puncture yielded a growth of the organism.

An excellent photograph of the condition is given.

H. Harold Scott.

ROJAS (Hector M.). **Sobre la verdadera naturaleza del llamado " pie musgoso."** [The True Nature of so-called " Mossy Foot."]—*Cronica Méd.* 1923. Nov. Vol. 40. No. 725. pp. 361–381. With 8 figs. [4 refs.]

The author, after reviewing the recorded history of this condition, gives an account of two patients under his own care and of some experimental work in connexion with the disease. Mossy-foot, he states, is not a distinct morbid entity, but is an elephantoid condition of the skin, which may arise from one or more of several causes. In THOMAS's case, in which the affection was ascribed to leishmaniasis, he holds that two conditions—cutaneous leishmaniasis and the elephantoid skin lesion—were coexistent. He calls attention to the erroneous conclusions which may inadvertently be drawn from inoculation experiments in rabbits. Thus, in his experiments the inoculated animal remained well, whereas the control developed spontaneously a condition precisely similar to that previously reported as having occurred after inoculation of tissue from the human lesion.

H. Harold Scott.

PARDO-CASTELLO (V.) & DOMINGUEZ (M. Martinez). **Achromia Parasitaria.**—*Arch. Dermat. & Syph.* 1924. Jan. Vol. 9. No. 1. pp. 82–93. With 8 text figs. (Discussion pp. 93–95.)

The clinical histories of 12 out of 36 patients with an apparently contagious affection are very briefly reported. The skin lesions consisted of dirty-white slightly pruritic macules, roughly circular or oval in shape, with a pinkish and faintly scaling surface in the early stage, which become quite white and smooth. Most commonly observed in dark-skinned persons, though not entirely confined to negroes, the condition was found chiefly on the face and neck, and might develop rapidly. In those few cases showing a generalized distribution the palms and soles, hair, nails and mucous membranes had not been affected. The cultural and microscopical characteristics of a fungus obtained from the lesions (only in the early scaly stage) of six cases are described. All inoculation experiments were negative. Without being able to identify the fungus sufficiently for classification this was considered to resemble *Aspergillus flavus*. In the commentary on the differential diagnosis the very slight scaliness of these lesions is emphasized in comparison with those of other mycotic affections.

W. J. O.

TRUJILLO (Plascencio) & MORAL. [**Maduromicosis.**]—*An. de la Soc. Med. Quir. del Guayas.* 1923. No. 8. [Summarized in *Rev. Española de Med. Cirug.* 1924. Jan. Vol. 7. No. 67. p. 31.]

This is the first case of Maduromycosis recorded from Ecuador. A man of 40 years, a native of Colombia, had lived and worked for 18 years in Ecuador; he went about barefoot. For some years he had noticed on the upper surface of the right great toe a painless swelling the size of a grain of maize; more recently several similar nodules appeared and sinuses formed discharging bloodstained matter with whitish-yellow granules. The bones were invaded and much deformity resulted. A growth was obtained and the organism identified as belonging to the group *Indiella.*

H. Harold Scott.

GUICHARD (F.) & JAUSION (H.). **Un cas de pied de Madura observé à Marrakech.**—*Arch. Inst. Pasteur d'Algérie.* 1923. Dec. Vol. 1. No. 4. pp. 641–644. With 2 plates.

Case report of a female native aged 30 whose affection of the left foot had followed a thorn prick. The clinical appearance was that of an infection of *Discomyces Madurae*; laboratory examination showed the fungus to be of the white-grained variety. Amputation of the foot was performed.

W. J. O.

ANDERSON (Ch.) **Sur un douzième cas de pied de Madura observé en Tunisie.** —*Arch. Inst. Pasteur de Tunis.* 1924. Apr. Vol. 13. No. 1. pp. 68–70. With 1 text fig. [3 refs.]

Case report from the Sadiki hospital, concerning a male of Southern Tunis with an infection of the right foot of six years' duration. Amputation of the foot was performed. The fungus was isolated and classified with the genus *Madurella Tabarkae.*

W. J. O.

PAGENSTECHER (Gustav A.). **Third Case of Mycetoma.**—*Jl. Amer. Med. Assoc.* 1924. May 24. Vol. 82. No. 21. pp. 1692–1693. With 1 fig. [1 ref.]

Case report of a Mexican woman, aged 36, in whom the condition of 10 years' duration had followed an injury to the right ankle region. White granules were observable in the pus and showed many branching mycelial threads on microscopical examination. Amputation was performed. Early amputation is recommended in this infection.

W. J. O.

GOMES (J. M.). **Nocardiose de localização rara.**—*Ann. Paulist. Med. e Cirurg.* 1923. Nov. Year 11. Vol. 14. No. 11. pp. 150–156. With 1 text fig. [16 refs.]

A man of 53 years, a field labourer, had suffered for some ten years with an eczematous condition of the shoulders resulting from carrying sacks of coffee. A year ago small swellings occurred which burst and discharged pus and blood. Examination of the pus showed yellowish-white granules, some with radially arranged club-shaped bodies, others of a filamentous structure. An organism allied to, but distinct from, *Nocardia bovis* was obtained in culture and grew readily on most media. The differences from *N. bovis* consist in the facts that it liquefied gelatin very slowly, if at all, and that intraperitoneal inoculation in rats and guinea-pigs gave rise to no lesions, the fungus being absorbed and disappearing. It is suggested that infection arose from the custom of applying leaves of various plants as dressings to sites of local inflammation.

H. Harold Scott.

LORO (H. A. M.). **L'urticaire de l'iroko.**—*Arch. Méd. et Pharm. Nav.* 1924. Mar.-Apr. Vol. 114. No. 2. pp. 136–140.

Fifteen cases were observed, in the course of one month, of urticaria occurring in those who handled iroko wood from the Cameroons in saw-mills (Forges et Chantiers) on the Mediterranean. Dust collected from the bark of the trunks was shown to be composed of the spores and mycelium of a mould of which the morphology is being investigated. Two severe cases with fever showed considerable oedema and extreme pruritus especially marked about the hairy parts of the body, the eyebrows and eyelids, with conjunctivitis and balanitis and an appearance of the scrotum resembling elephantiasis, and signs of laryngitis. The hands were unaffected. All the remaining cases were able to continue at work with some slight oedema about the eyelids, prepuce and scrotum, and intense irritation. The preparatory cleansing of the bark by heat and washing in potassium permanganate solution is recommended, and prophylactic measures for the workers are described.

W. J. O.

MENDELSON (Ralph W.). **Keratoma Plantare Sulcatum.**—*Jl. Trop. Med. & Hyg.* 1924. Feb. 15. Vol. 27. No. 4. p. 39. With 1 fig.

Prolonged irritation and pressure are considered to be the causal factors of this affection, which is not uncommon in Siam, and this belief is strengthened by the distribution of the keratosis respectively in normal and flat-footed individuals. The characteristic punched-out holes following the detachment of the keratosic areas differentiate clinically this condition from tylosis, and the absence of framboesiform nodules and other lesions on the body from yaws.

W. J. O.

CORPUS (Teofilo). **A Survey of Ulcus Tropicum.**—*Jl. Amer. Med. Assoc.* 1924. Apr. 12. Vol. 82. No. 15. pp. 1192–1194. With 4 figs. [3 refs.]

The affection is most prevalent during the damp season, but is not common among those school children whose feet are covered. In 35·5 per cent. of the cases examined a positive finding of spirochaetes (Eggerts' Type A) was obtained, while almost all specimens showed streptococci and staphylococci considered to be secondary infections. With regard to the clinical appearance of the lesions "there is no particular feature about the diagnosis." Two methods of treatment are advocated—(1) local application of 3 per cent. solution arsphenamin, (2) bathing with 1 : 4000 solution potassium permanganate and dusting with Vincent's powder (1 part sodium hypochlorite with 9 parts acid boric).

W. J. O.

PAMPANA (E. J.). **A Note on the Treatment of Ulcus Tropicum.**—*Trans. Roy. Soc. Trop. Med. & Hyg.* 1923. Nov. 15. Vol. 17. No. 5. pp. 331–333. [6 refs.]

Daily dressings of acriflavine solution 1 : 1000 are advocated. A positive experimental inoculation of pus from a typical lesion is reported.

W. J. O.

BOUFFARD (G.). **Gangrène de la lèvre supérieure et association fuso-spirochétienne.**—*Bull. Soc. Path. Exot.* 1923. Dec. 12. Vol. 16. No. 10. pp. 719–725. With 4 figs.

Two cases are reported and a general description of the condition is given. Commencing always on the inner aspect of the upper lip, more usually on the left side of the middle line, the gangrenous ulceration may spread rapidly to the cheeks but usually spares the buccal mucosa. The condition appears in healthy young children and thus, with its peculiar localization, is to be differentiated from noma. The infection is believed to be a primary one and it is possible that the infecting symbiotic organisms may live a saprophytic existence in the soil; the mode of infection is obscure. The writer has obtained very satisfactory healing results by the local application, 3–4 times daily, of a 4 per cent. novarsenobenzol solution in glycerine.

W. J. O.

RANDALL (Alexander). **Therapeutic Value of Two New Synthetic Antimony Compounds in Cases of Granuloma Inguinale.**—*Jl. Urol.* Baltimore. 1923. June. Vol. 9. pp. 491–504. With 3 figs. 4 refs.]

The empirical use of the synthetic antimony compounds (1) sodium antimony thioglycollate and (2) triamide of antimony thioglycollic acid gave uniformly good results in the treatment of 3 cases of granuloma inguinale reported; they appeared to be less toxic than tartar emetic while containing practically equivalent amounts of antimony.

W. J. O.

HORWITZ (H. L.). **Granuloma Inguinale.**—*Med. Jl. & Record.* New York. 1924. Feb. 20. Vol. 119. No. 4. (Whole No. 2275.) pp. 199–200. [10 refs.]

A short account of this affection is followed by the report of one case of 4 years' duration which reacted satisfactorily to specific tartar emetic medication.

W. J. O.

i. DECROP & CRAMBES. **Un cas de nodosité juxtaarticulaire.**—*Maroc-Médical.* 1923. Apr. 15. No. 16. p. 117.

ii. REMLINGER (P.). **Note sur un cas de nodosités juxtaarticulaires observé à Tanger chez un Européen.**—*Ibid.* July 15. No. 19. p. 201.

iii. DEKESTER & MARTIN. **Seize cas de nodosités juxtaarticulaires chez des Marocains. La nodosité médio frontale. Étude anatomo-pathologique.**—*Ibid.* pp. 202–205. With 2 figs.

i. Brief case report of a woman, aged 35, with recent syphilis and nodules of 4 years' duration arranged for the most part symmetrically about the large joints. While anti-syphilitic (arsphenamin) treatment cleared away the mucous patches, this had no effect upon the juxtaarticular lesions.

ii. Case report of a Spaniard, aged 26, resident 4 years in Morocco, with one subcutaneous nodule about each elbow causing some pain on movement of these joints. The patient showed no signs of syphilis while he admitted having had several attacks of gonorrhoea. Anti-syphilitic treatment and excision of the nodules were refused.

iii. In the commentary on the sixteen cases very briefly reported the conclusion is drawn that the nodules in question, not necessarily in relation to the joints in every case, occur most frequently in syphilitic subjects as the result of repeated local friction over bony prominences, and are of a chronic inflammatory nature.

W. J. O.

BROUARD (M.). **Nouvelle observation de nodosités juxta-articulaires syphilitiques chez un européen.**—*Arch. Inst. Pasteur d'Algérie.* 1923. Dec. Vol. 1. No. 4. pp. 621–623. [8 refs.]

The histological appearances of the lesions occurring in symmetrical distribution in each retrotrochanteric region of a Spaniard aged 26 are described, from the military hospital at Colomb-Bechar. The Wassermann reaction was partially positive, while the history and clinical signs of venereal disease were negative. Previously to excision anti-syphilitic treatment had modified slightly one of the two lesions.

W. J. O.

GALLI-VALERIO (B.). i. **Haben die multiplen subkutanen harten fibrösen Geschwülste der Malaien einen Framboësia-Ursprung?** [Are the Multiple, Subcutaneous, Hard Fibrous Swellings of Malays of Framboesial Origin?]—*Arch. f. Schiffs- u. Trop.-Hyg.* 1923. Nov. Vol. 27. No. 10. pp. 365–366. With 1 fig. [7 refs.]

ii. **Zur Ätiologie der multiplen subkutanen harten fibrösen Geschwülste der Malaien.**—*Ibid.* 1924. Apr. Vol. 28. No. 4. pp. 167–168. [3 refs.]

i. The purpose of this short article is to disprove the arguments of VAN DIJKE and OUDENDAL that the nodules in question have their origin in yaws. (See this *Bulletin*, Vol. 20, p. 288.) After examining numerous sections, in only one of which he had been able to find elements resembling spirochetal bodies, Galli-Valerio considers that the spirochetes figured by those writers most probably were merely fibrils of connective or elastic tissue, such as the alleged spirochetes reported by other observers in sections of certain other skin diseases.

ii. In this supplementary note to his previous communication acknowledgment is made of the recognition of a spirochete in one of OUDENDAL'S sections examined by the writer.

W. J. O.

SOBERNHEIM (G.). **Zur Ätiologie der multiplen Fibrome der Malayen.** [The Etiology of Multiple Fibromata among the Malayans.]—*Arch. f. Schiffs- u. Trop.-Hyg.* 1924. Feb. Vol. 28. No. 2. pp. 73-75. With 3 figs. [12 refs.]

The microscopical examination of sections stained by the Levaditi silver impregnation method revealed definite spirochaetal bodies, which in the preparations so submitted to the writer could not be with certainty differentiated as *S. pallida* or *S. pertenuis.*

W. J. O.

ARNAUD. **Sur un cas d'Aïnhum chez un Marocain.**—*Maroc-Médical.* 1923. Mar. 15. No. 15. p. 85.

In the case reported the right small toe had been amputated by the disease before coming under the observation of the writer, while in the corresponding toe of the left foot the disease was actually in progress. The Wassermann reaction was negative and there were no signs of leprosy. The patient was the son of a Soudanese negro while his mother was a Moroccan. Attention is drawn to the rarity of diseases common to negroes among the Moroccans in spite of their frequent mixed parentage.

W. J. O.

QUIRK (E. J. J.). **A Case of Ainhum in the Hand.**—*Nigeria Ann. Med. & San. Rep. for the Year 1922.* pp. 23–24.

Case report of a male native, aged 25 years, in whom the little finger [no mention made of which hand] had been swollen and powerless for 2 years. No history of injury or previous disease was obtained. The extreme rarity of ainhum affecting the fingers is noted.

W. J. O.

PANJA (Ganapati). **Leukoderma.**—*Calcutta Med. Jl.* 1923. Nov. Vol. 18. No. 5. pp. 491–499. With 4 plates.

The writer's personal views concerning the formation of skin pigment are put forward to introduce some hypothetical explanations of the occurrence of leucoderma. Various clinical varieties are described. In this contribution to the study of the pathogenesis of skin depigmentation perhaps the most useful section is that in which the constituents of some advertised quack remedies for this peculiar skin condition are named.

[Many dermatologists will not agree with the writer's statement that melanoblasts are derived from the mesoderm and manufacture melanin in their position below the basal cell layer of the epidermis.]

W. J. O.

ARCHIBALD (R. G.). **An Unusual Case of Vitiligo in a Native of the Sudan.**—*Jl. Trop. Med. & Hyg.* 1923. Dec. 15. Vol. 26. No. 24. pp. 361–363. With 1 plate. [1 ref.]

Interesting case report of a male native of Northern Sudan in whom the depigmented patches of skin had been gradually making their appearance on the face, trunk and limbs over a period of three years, commencing on the lower lip. There was also patchy depigmentation of the hairs of the scalp, axillae and pubis. No etiological factor was determined. The blood pressure was low, the Wassermann reaction was negative and there were no signs of syphilis or leprosy. Following the loss of pigment on the back of the neck there had resulted considerable erythema from exposure to the sun, and the patient complained that he had felt the heat more readily than formerly. Sections of the depigmented skin showed hyaline degeneration and vacuolation of the rete mucosum in addition to much diminished pigment in the usual sites. The case was treated with liquor arsenicalis. In some four months' time fresh pigment had begun to appear in the leukodermic patches, especially about the hair follicles on exposed areas and more particularly on the hands and neck.

W. J. O.

DUGA. **Un curieux cas de dépigmentation généralisée chez un indigène de Tshamba circonscription de Garoua (Cameroun).**—*Ann. de Méd. et de Pharm. Colon.* Paris. 1923. Sept.–Oct.–Nov.–Dec. Vol. 21 [23 *sic*]. No. 3. pp. 360–361.

Brief report of a male native, aged 61, whose entire skin, with the exception of a ring about the orbits and upon the scrotum, had become white since the age of 30 years. This depigmentation had progressed at intervals, each progression being accompanied by febrile attacks and itching. No cause was discovered. On palpation the dermis appeared thickened and suggested leprosy, which diagnosis was negatived by microscopical examination. One first cousin was a leper. One brother and one sister also showed loss of skin pigment but in a lesser degree.

W. J. O.

JAMIN (H.). **Dix-septième observation Tunisienne de Xeroderma pigmentosum.**—*Arch. Inst. Pasteur de Tunis.* 1924. Apr. Vol. 13. No. 1. pp. 129–132. With 1 plate.

Report of a typical case of Xeroderma pigmentosum occurring in a native girl, aged 10 years, showing considerable epitheliomatous ulceration of the nose. The exposed areas all showed characteristic lesions, while a moderate pruritus of the affected areas was a feature of this case. The condition had commenced at the age of three years. No family history of any similar skin trouble was obtained.

W. J. O.

GEORGELIN. **Note au sujet de deux cas de pseudo-myiase rampante (creeping disease—myiase linéaire, larbisch du Sénégal).**—*Ann. de Méd. et de Pharm. Colon.* Paris. 1923. May–June–July–Aug. Vol. 21 [22 *sic*]. No. 2. pp. 182–186.

This paper is not much informative. In one case the shifting itchy red streaks, two or three cm. long and 1·5 mm. broad, appeared on the hands of an adult European a few days after he had been manipulating fresh turned soil. They continued to shift, to disappear and advance, and to itch, with a periodic intensity, for about six or seven months, and then they very gradually ameliorated until at the end of 14 months nothing could be seen or felt. They were implacable to treatment, but the local application of iodine seemed to stop their advance momentarily and to change its direction. Nothing of the nature of a parasite could be discovered. The second case occurred in the buttock, the patient being a half-caste infant; little is said beyond that microscopic examination did not reveal anything.

A. Alcock.

CLAPIER & GEORGELIN. **Un cas de "Larbisch" chez une européenne à Libreville (Gabon).**—*Bull. Soc. Path. Exot.* 1923. Nov. 14. Vol. 16. No. 9. pp. 665–668. With 1 fig.

An interesting item in this case of creeping disease, which otherwise is not remarkable, is the report of the examination of the blood, which certainly is suggestive. In the earliest stages the lymphocytes were reduced to 4 per cent. and the polymorphonuclear eosinophiles formed 30·6 per cent. After the disappearance of the lesions the percentage of lymphocytes was 30·5 and 2·7, and that of eosinophiles had fallen to 7 and 9 at the two examinations recorded.

A. A.

THIBIERGE (George). **Sur la transmission à l'homme de la gale sarcoptique du chat.**—*Rev. Path. compar. et Hyg. Gén.* 1923. May 5. Vol. 23. No. 228. pp. 1–10. [9 refs.]

The morphology of *Sarcoptes* (*Notoedres*) *cati* is briefly described and its size compared with and shown to be inferior to that of *Sarcoptes scabei*. Clinically the lesion produced by the parasite of feline scabies in man consists primarily of a small rose-coloured papule, slightly raised above the surface and pointed in the centre, resembling a small papule of strophulus. A vesicle soon develops in the centre, which vesicle breaks to form a brownish crust, the lesion becomes paler and flatter to leave only a brownish or greyish crust to persist for a few days. This lesion is differentiated from other prurigo papules by being discrete, not accompanied by any secondary change (in uncomplicated cases) and by its distribution. Linear burrows and the vesicle accompanying such burrows of human scabies are entirely absent; pustulation does not occur unless the case is complicated by pediculosis. Occasionally, however, some lesions may be confluent with the appearance of urticarial formation. Characteristic is the arrangement of the papules in groups and their asymmetrical distribution most commonly on the trunk and limbs, particularly on the proximal areas of these, on the anterior aspect of the axillae, on the scapular region and occasionally about the waist. Removal of the infected animal readily leads to the disappearance of the lesions of the "host."

The differential diagnosis from other forms of prurigo and parasitic infection is recounted. Experimental transmission of *Notoedres cati* showed the life of this parasite on human skin to be brief, probably not longer than 48 hours. The usual mode of contagion is directly from the animal itself or indirectly from linen, especially bed-linen, with which the infected animal has been in close contact. Treatment consists in simple bathing and the application of emollient ointments: All anti-parasitic local applications are to be avoided.

[This paper is an admirable and comprehensive account of the disease.]

W. J. O.

PANJA (Ganapati). **Notes on the Aetiology of Some Skin Diseases met with in the Tropics.**—*Indian Med. Gaz.* 1924. Apr. Vol. 59. No. 4. pp. 184–186.

The title of this short article sufficiently explains its contents. The writer's observations over a wide field are so condensed as to make the communcation of no real scientific and of little clinical value.

W. J. O.

FRANK (Robert T.). **Granuloma Inguinale: Report of a Case.**—*Southwestern Med.* 1923. Nov. Vol. 7. No. 11. pp. 401–403. With 1 fig.

JAMIN (H.). **Suite de la neuvième observation Tunisienne de Xéroderma pigmentosum.**—*Arch. Inst. Pasteur de Tunis.* 1924. Apr. Vol. 13. No. 1. pp. 133–134.

RODRÍGUEZ ARJONA (V.). **[Mal del Pinto in Yucatan.]**—*A.M.M., Mexico, D. F.* 1923. Vol. 1. p. 555. [Summarized in *Jl. Amer. Med. Assoc.* 1924. Mar. 29. Vol. 82. No. 13. p. 1085.]

BERIBERI.

FAR EASTERN ASSOCIATION OF TROPICAL MEDICINE. **Statements laid before the Committee on Beri-Beri Control and the Resolution recommended by the Committee as amended by the Council and passed at the General Meeting of the Fifth Congress of the Far Eastern Association of Tropical Medicine. 1923.**—12 pp. 1923. Singapore: Govt. Printing Office.

The members of the Fifth Congress came to the conclusion that any international convention for the control of beriberi was at present impracticable. They considered that beriberi was a disorder of nutrition, and that in the Far East the principal factor of its causation was the use of overmilled rice. They recommended further research on (1) the standardization of rice; (2) the effects of transport and storage; (3) economic considerations.

It was agreed that a beriberi international committee should be set up, to report at the next Congress, but in the meantime each Government should encourage research work to devise and apply practical methods for improving the diet of the general population, particularly with regard to the too exclusive use of overmilled rice.

The greatest use should be made of all educational opportunities.

P. W. Bassett-Smith.

MEGAW (J. W. D.). **The Beriberi Problem.**—*Fifth Congress Far Eastern Assoc. Trop. Med. Singapore, September, 1923.* 18 pp. [7 refs.]

The author was asked to put forward at the Congress his views on the etiology of beriberi against those of FRASER & STANTON, which are largely accepted in the Far East. They were fully stated in this *Bulletin*, Vol. 20, pp 812–4. The variety of conditions called beriberi and the want of sufficient clinical knowledge are emphasized, and a provisional definition is suggested. The author considers the cardiac signs as a *sine qua non* of beriberi, and does not appear to give sufficient value to beriberi in areas where rice is not the staple diet, but of which there is much evidence now. The whole paper is naturally full of debatable points, but the conclusions are definite that the disease is due not to a deficiency of vitamin B, but to an intoxication brought about by the consumption of damaged rice, the noxious product being produced before the rice is eaten; of this product or toxin no definite evidence has yet been found. This "rice intoxication disease" is a separate entity from avitaminosis B. In the main it is a reversion to BRADDON's theory, and the practical outcome is the importance of careful storage and preparation of the rice, with certain dietetic rules which must be kept.

[Papers like this are most stimulating, for there is no doubt that the last word on the etiology of beriberi has not been said, and more information is required to connect up cause and effect. It is very easy to build up a case when working by induction, but the results have to be carefully checked before they are accepted.]

P. W. B-S.

OGATA (Tomosaburo), KAWAKITA (Shintaro), KAGOSHIMA (Shigeru), SUZUKI (Susumu) & OKA (Harumiti). **On the Question of Identity of Beri-Beri with Polished Rice Disease.**—*Japan Med. World.* Tokyo. 1924. Feb. 15. Vol. 4. No. 2. pp. 23–27. [10 refs.]

——, —— OKA (Harumichi), SUZUKI (Susumu) & KAGOSHIMA (Shigeru). **Kritische Betrachtung ueber Identität oder Nichtidentität der Vitamin-B-mangelkrankheit mit der menschlichen Kakke.**—*Deut. Med. Woch.* 1924. Apr. 25. Vol. 50. No. 17. pp. 527–529. [10 refs.]

The authors summarize their experimental work of many years on beriberi and polished rice disease. The latter they prefer to call avitaminosis, and consider to be distinct from beriberi.

They believe that the frequent errors that have been made of attributing beriberi to a deficiency of vitamin B alone are due to a superficial and incomplete knowledge of the clinical and pathological facts. The differences are categorically set out under twelve headings, and a conclusive factor according to them is that in the avitaminosis of birds there is a decrease of the vitamin B in the tissues, which is not the case in the bodies of beriberi patients that have been investigated as compared with non-beriberi cases. In infants fed upon a special cereal powder NAGAYO has described a condition which exactly resembles polished rice disease, or avitaminosis, and differs from true beriberi. The greater part of the material in the paper has been previously published.

P. W. B-S.

OHOMORI (Kenta). **Studies on the Cause and Treatment of Beri-Beri in Japan.**—*Japan Med. World.* Tokyo. 1923. Nov. 15. Vol. 3. No. 11. pp. 231–238.

——, OHHASHI (Yoshihiko), NAKANISHI (Toshita), HARA (Masatoshi) & OHTA (Toshiwo). [**Studies on the Etiology of Beriberi.**]—*Keio Igaku (Kei o Med. Jl.).* 1923. Mar. Vol. 3. No. 3. [Summarized in *Japan Med. World.* Tokyo. 1923. Nov. 15. Vol. 3. No. 11. pp. 249–250.]

Human experiments showed that beriberi patients fed with food rich in vitamin B recovered; when it was deficient in the vitamin they got worse; if the food had a very high carbohydrate content the onset was hastened, but if there was much protein and fat it was retarded. There was also some relation between the oedema and salt retention.

In feeding experiments the incubation period varied from 7 to 10 days, but this depended upon the amount of food taken.

The conclusion is that as beriberi is a metabolic disease due to avitaminosis, it can be cured or prevented by a supply of vitamin B. Recovery is slower in human than in animal beriberi, as the disease of the nerves is greater. One of the predisposing causes is considered to be a "status lymphaticus" with large thymus glands when the heart is often small and the blood-pressure low. In severe cardiac cases of beriberi the thymus gland and Peyer's patches are often enlarged. The inducing causes are warm temperatures and high degree of humidity in low lands where there is much overcrowding; debilitating diseases and pregnancy increase the incidence.

The authors differ from most Japanese investigators in considering that the avitaminosis of birds and beriberi are similar, and that both may be cured by supplying vitamin B.

P. W. B-S.

SCALA (A.). **Sull' etiologia del Beriberi.**—*Ann. d'Igiene.* 1924. Mar. Vol. 34. No. 3. pp. 184–189. [4 refs.]

Experiment has shown that the nerves in animals suffering from polyneuritis exhibit a delay in transmission of impulses. The rapidity of cure resulting from the use of bran extracts contraindicates histological degeneration and points to some toxic action. This toxin is believed to be an acid, or an excess of H-ions in the nervous tissues.

In order to test this the author determined the velocity of propagation of impulse before and after injection of extract and found that in the latter case, as also in a normal animal, the rate was 60 metres per minute, whereas in cases of polyneuritis it was "much slower." He then carried out an analogous series of experiments on nerves artificially paralysed by immersion in Ringer's solution to which hydrochloric acid had been added. Some were then treated with extract and immersed in neutral Ringer's fluid, others were left in the acid solution and extract added. Recovery was more rapid in the latter. The extract was further found, when added to a solution of HCl, to diminish markedly the acidity; it has also the property of reducing surface tension and is thus rapidly absorbed. To this twofold action is ascribed the rapid amelioration of polyneuritic animals.

The author next examined the H–ion concentration of paralysed nerves and found that it was the same in a nerve excised from a fowl suffering from polyneuritis as in a healthy nerve paralysed by immersion in acid, or in one taken from a fowl paralysed after feeding with polished rice, but 5–10 times that of a normal healthy nerve.

There was no corresponding change in the H–ion content of the blood, and it is concluded, therefore, that nerves have the property of electively fixing these ions and that "anti-beriberic vitamin is a colloid substance and probably of proteid nature and acts by detoxicating the organism or the nervous system by neutralizing the acid, a property possessed by all colloids."

[The author apparently takes it for granted that beriberi and polyneuritis gallinarum are the same.]

H. Harold Scott.

MCCARRISON (Robert). **Rice in Relation to Beri-Beri in India.**—*Brit. Med. Jl.* 1924. Mar. 8. pp. 414–420. With 5 figs.

The observations and experiments, with the deductions made from them, on the beriberi rice problem are from the experience of the author in India and do not necessarily apply to other parts of the world. He first enumerates the various theories that have been put forward and shows that all are defective. All areas where rice is the basic diet are not affected with beriberi, viz., the west coast of India, while in the same latitude on the east the heaviest infected endemic district is found. In non-endemic areas the consumption of parboiled rice gives only about one tenth the number of cases to that of raw and polished rice, yet in the endemic centres this reduction does not occur. In the endemic area in Madras, it is those living on a mixed diet that suffer most; the Hindus who do not use parboiled rice at all, are least affected. It is stated that in Madras beriberi only *originates* in jails in the endemic zone. There is also the important fact that out of 565 cases in India from 1900–1914, 492 were in Madrasees. From these observations, many of them made by MALCOLMSON in 1835, the author is convinced that there are factors in the causation of beriberi in endemic areas—apart from the exclusive use of a rice dietary—which are absent or feebly potent in non-endemic areas. No evidence was found of an intrinsic poison in the rice itself.

From a very large number of experiments with all kinds of rice on pigeons three important points were demonstrated; (1) the beneficial effects of parboiling; (2) the effects of various degrees of milling and polishing; (3) the enormous loss of nutrition and vitamin values entailed by high milling and polishing. A rice may be potent to cause polyneuritis columbarum and yet not be associated with human beriberi in places where it is known to be the staple diet for man. In the series at Madras it was shown that it is rather those kinds of rice that are relatively less deficient in vitamin B than those that are relatively more deficient in this factor that are known to be associated with human beriberi. Curiously it was only quite recently that McCarrison ever saw a case of beriberi in his pigeons, viz., with enlarged and degenerated heart, enlarged liver and adrenals, polyneuritis and hydropericardium. These signs were found in birds fed upon Masulipatam rice, which has a fair amount of vitamin B, in the most noted beriberi centre in India. In an experiment with this rice on three birds, one maintained its weight and health, one died of beriberi on the fifteenth day, and one died of septicaemia on the 38th day; in another experiment with the same rice, out of 18 birds, two developed beriberi and six polyneuritis. From this variability (which renders any deductions difficult) he develops his " carrier " theory, that there is some factor in the birds themselves, which, associated with a deficiency of vitamin B, gives rise to the syndrome of beriberi. This view is supported by the fact that the disease was more common in Bangalore birds than in birds obtained from a beriberi-free neighbourhood.

A very interesting example is given of birds fed upon clean polished rice, developing polyneuritis in 25 days, and others fed on millet exclusively, none of which got beriberi, but if the two foods were combined, the birds lived longer and developed beriberi symptoms. There was here no complete want of vitamin B, but an insufficiency in the millet to metabolize the rice. Thus beriberi in pigeons is not due to a complete lack of vitamin B in the diet (there is not time enough for the heart lesions to be produced), but to a condition of *insufficiency*.

The author shows that there was a similarity between the cause and incidence in his pigeons and of an outbreak in a battalion of 800 Gurkas; here the case incidence was 3·7 against 3·8 in the birds and the small percentage infected or large percentage who escaped is explained by the surmise that the infected may have been " carriers " of some organism whose products acted upon the heart muscle, or some change occurred in the gastro-intestinal flora, or that by faulty metabolism an intrinsic poison was evolved. The evidence of a poison in the infected birds is, he thinks, clear, and this late work supports his conclusion of 1919, that vitamin deficiency is rarely the sole agent in the causation of beriberi.

In pigeons beriberi-like diseases may be divided into :—

(1) Infective polyneuritis due to infection, but favoured in its genesis by vitamin deficiency.

(2) Polyneuritis due to vitamin deficiency only.

(3) Polyneuritis due to vitamin deficiency but precipitated by various infections.

(4) A disease presenting the characters of true beriberi, due to an unknown agent acting in association with insufficiency, but not complete want of vitamin.

The same variability of symptoms in man may also be due to similar etiological factors. The disease itself requires more clinical study.

[The evidence brought forward by MURATA (see below), that the heart symptoms are sequelae rather than primary and necessary signs must be considered, also the fact that polyneuritis if prolonged does go on to beriberi in animals. There does not seem to be any definite line between the one and the other.]

P. W. B-S.

KING (W. G.). **Rice in Relation to Beri-Beri.** [Correspondence.]—*Brit. Med. Jl.* 1924. Apr. 12, pp. 688–689.

From his long experience in the Madras Presidency Col. KING draws attention to much of interest bearing on MCCARRISON's " local poison " theory of beriberi. To the " conditions " noted he suggests the addition of, " and under any circumstances of personal or communal hygiene tending materially to affect health," the influence of general hygiene as an accessory factor being of the greatest importance. Historically there is evidence that beriberi was present long before rice was in general use, and even now in the Kistna district rice is merely a luxurious addition to dry grain. In the periods of famine, 1876–78 and 1896–97, symptoms of starvation rather than of beriberi were present. Generally MCCARRISON's views are supported, but the warning that " any of the numerous theories of beriberi causation might be supported by data gathered in equally diverse areas " is very pertinent. The importance of *early* blood examinations to detect a possible infecting virus is emphasized.

P. W. B-S.

BOSE (S. R.). **The Spore-forming Bacterium on Rice-Grains used by Families suffering from Beri-Beri and Epidemic Dropsy.**—*Lancet.* 1924. May 24. pp. 1054–1055.

The author gives more fully his investigations regarding the spore-bearing proteolytic organism (see this *Bulletin*, Vol. 21, p. 97), which he found in both healthy and damaged rice. He cannot credit that an organism so abundant and generally diffused can be the cause of epidemic dropsy, which is a comparatively rare disease.

P. W. B-S

BERNARD (P. Noël) & GUILLERM (J.). **Action de** *Bacillus asthenogenes* **sur les aliments (recherches sur le béribéri).**—*Bull. Soc. Path. Exot.* 1923. Dec. 12. Vol. 16. No. 10. pp. 743–760. [5 refs.]

The *B. asthenogenes* isolated from cases of fever of undetermined origin in Cochin China (1920), and causing pathogenic symptoms in piglets, is here studied with relation to its action on food substances and to beriberi. Much detailed work is given, It ferments hydrocarbons, proteins, etc., with formation of various volatile and fixed acids, the variety of acids, propionic, butyric, acetic, etc., depending on the quantity and quality of the foods. Animals fed on rice and infected with *B. asthenogenes* developed irritation and ulceration of the gastric and intestinal mucous membranes dependent upon the acids produced by fermentation, with an asthenic condition of the stomach and early constipation. There does not appear to be any evidence that the destruction of vitamin B is caused by this microbic fermentation. It is thought that the study of the fermentations in the stomach of the piglets affected experimentally and of human beriberi are important subjects for further research. P. W. B-S.

BERNARD (P. Noël) & GUILLERM (J.). **Action de *Bacillus asthenogenes* sur les corps phosphorés organiques. (Recherches sur le béribéri.)**—*Bull. Soc. Path. Exot.* 1924. Feb. 13. Vol. 17. No. 2. pp. 153–163. [5 refs.]

In the belief that a low phosphorus content in the food plays a part in the production of beriberi, and assuming the correctness of the statement made by BRÉAUDAT (1913) that beriberics excrete more purins and phosphates than they ingest, experiments were made to determine if *B. asthenogenes* reduces the phosphates in food by converting organic compounds into inorganic less easily assimilated forms. An analysis of the organism showed it to be rich in phosphates, and when grown on various media it was able to mineralize the phosphorus compounds in animal substances, but with vegetable substances (as bran, whole rice, etc.) these compounds remain in their organic condition. The quantity of soluble organic phosphorus will vary according to the amount of decortication. If therefore a deficiency of organic phosphate (nucleoproteids, etc.) plays an essential part in the production of beriberi, then it is possible that an organism like *B. asthenogenes*, which impedes the assimilation of the phosphorus compounds ingested, might play an important part in causation.

P. W. B-S.

FLEMING (Wm. D.). **Metabolic Mechanism in Beriberi.**—*Philippine Jl. Sci.* 1923. Nov. Vol. 23. No. 5. pp. 407–411. [13 refs.]

This is a study of the metabolic changes that take place in human beriberi. The experiments were carried out at the Philippine General Hospital, Manila. The work consisted in a determination of the basal metabolic rate, urinary nitrogen, respiratory quotient, and the fractions of heat derived from proteins, fats and carbohydrates respectively. The following results were obtained :—(1) In a series of beriberi cases the basal metabolic rate was the same as that of the normals, the respiratory quotients were normal, the combustion of fat, protein, and carbohydrates were practically so. There was no evidence of a high carbohydrate intake acting as a disturbing factor. (2) The blood sugar value was against the high carbohydrate intake causing a diabetic tendency. (3) There was no evidence of damage to the excretory power of the kidney in either wet or dry beriberi.

P. W. B-S.

KOBAYASHI (Yoshiwo). **[On the Consistency and NaCl Contents of the Blood and Edematous Fluid in Beriberi and Other Edematous Diseases. I. Communication on the Study of Edema in Beriberi.]**—*Nisshin Igaku (Progress in Medicine).* 1923. Sept. Vol. 12. No. 11. [Summarized in *Japan Med. World.* Tokyo. 1924. Jan. 15 Vol. 4. No. 1. p. 13.]

The albuminous content of both blood and fluids from the tissues in beriberi was reduced, differing thus markedly from conditions found in nephritis. The general features indicated a disturbance of the tissues rather than one of the blood circulatory system. Beriberi oedema appears therefore not to be of renal origin.

P. W. B-S.

McCarrison (Robert). **The Relation of Manure to the Nutritive and Vitamin Value of Certain Grain.**—*Brit. Med. Jl.* 1924. Mar. 29. pp. 567–569. [3 refs.]

The restricted endemic distribution in India of beriberi [see above] led the author to believe that possibly the nutritive and vitamin value of food grains may vary with the condition of the ground and the manure used in its cultivation. Fortunately in Coimbatore, at the central farm of the Madras Agricultural College, 10 permanent plots laid down in 1909 and dressed with varying kinds of artificial and natural manures were available; and on these crops of millet were grown and used for the tests carried out on groups of pigeons at the Pasteur Institute, Coonoor. These experiments were divided into three series:—(1) On a vitamin-free diet plus regulated quantities of the millet from the 10 different plots, the weight of the birds was carefully noted; the greatest daily loss occurred in the birds fed upon the millet grown on non-manured ground, and least with that fertilized continuously with cattle manure; that is, the nutritive value of the grain varied with the manure used: (2) When the birds were fed exclusively on the various forms of millet, those receiving the grain from the cattle-manured plots gained most in weight. (3) A further experiment showed that this grain also delayed the onset of polyneuritis in the pigeons to which it was given. Though these experiments are in no way final, they definitely point to the conclusion that, as is found in practical experience, "farmyard manure does contain something which artificial manure does not" and probably that part of this "something" is an increase of both nutritive and vitamin B values.

[The work that has been done is extremely interesting and suggestive; in the near future, when funds are available, it will no doubt be followed up, when more conclusive deductions will be possible.]

P. W. B-S.

Bassett-Smith (Percy). **Naval Medical History of the War. Section of Tropical and Sub-Tropical Medicine. Part VI.—(i) Beri-Beri.**—*Jl. Roy. Nav. Med. Serv.* 1924. Jan. Vol. 10. No. 1. pp. 34–38. With 1 text fig.

Most of the cases occurred during the first two years of the war, and were either among the native crews of armed cruisers or among ratings who had been serving in the Persian Gulf. In 1914 eighty-six cases occurred in the armed cruisers on the China station; all were native ratings with the exception of one engine-room officer. These men could not be induced to eat unpolished rice, but preferred to go hungry; they had, however, in addition fresh meat every day and fresh vegetables. An outbreak on H.M.S. Fox in the East Indies station was ascribed to the trying climatic conditions, mouldiness of the flour, and a monotonous diet. There was one death. All cases treated at Greenwich received besides ordinary anti-beriberi diet, an alcoholic extract of wheat bran and wheat embryo. Cases of ship beriberi occurred amongst Europeans, who, though suffering from other symptoms, retained the knee jerks throughout their illness.

P. H. Manson-Bahr.

MEGAW (J. W. D.) & BHATTACHARJEE (S. P.). **An Outbreak of the Epidemic Dropsy Form of Beriberi in Calcutta.**—*Indian Med. Gaz.* 1924. Apr. Vol. 59. No. 4. pp. 169–173. With 1 map.

The epidemic consisted of 70 cases divided into six groups.—Campbell Medical School, lady students; Hindu working classes; three groups of Mahomedan working classes; Anglo-Indian railway employees. These cases occurred in small groups in one quarter of the city, almost simultaneously; the clinical symptoms were not severe and there were only two deaths, both in untreated cases. A dietary table for the affected groups and controls is given which appeared to supply sufficient calories and vitamins, but the one common article of food was rice of the " parboiled " variety. There was evidence that the rice had been mostly stored for about a year. The map illustrates the relationship of the store and the incidence of the cases. If the disease is caused by poisoned rice it is likely that it came from the large rice market of Beliaghata. Controversial argument is entered into with regard to vitamin deficiency or a rice toxic origin of the disease, and the view is insisted on that avian polyneuritis and human beriberi are not definitely comparable, and though deficiency of vitamin B may be a secondary cause (in this as in other diseases) it is not the primary etiological factor.

P. W. B-S.

FERNANDO (Antonio S.). **Laryngeal Symptoms in Beriberi.**—*Philippine Jl. Sci.* 1924. Jan. Vol. 24. No. 1. pp. 41–43. [1 ref.]

In cases of infantile beriberi, aphonia is one of the most common symptoms. The author describes two cases of adult beriberi in which there was loss of voice with paralysis of the left vocal cord. In both there was marked enlargement of the heart which might have caused the pressure symptoms, but as laryngeal signs are uncommon and hypertrophy of the heart frequent, this explanation is less reasonable than that of VEDDER who considers the aphonia " probably due to degeneration of the pneumogastric nerves thus causing paralysis of the laryngeal muscles."

P. W. B-S.

SACCHETTO (Italo). **Le alterazioni di sviluppo dello scheletro nel beri-beri sperimentale. Nota 1.** [The Changes in the Development in the Skeleton in Experimental Beriberi.]—*Pathologica.* 1923. Sept. 1. Vol. 15. No. 355. pp. 515–521. With 2 figs. & 1 graph. [15 refs.]

The author used for the experiments young fowls fed on polished rice or polished barley, with efficient controls. The weight curves were taken and the birds killed after about three months, when special attention was paid to the condition of the long bones and internal organs. The failure of growth was most marked in those fed upon polished barley. The chief characteristics recognised were (1) Diminished chondral ossification with fewer osteoblasts and little lamina formation. (2) Diminished periosteal activity and ossification. (3) Abnormal condition of the ossifying cartilages; absence of haemorrhages as seen in scurvy, or rarefaction as in rickets.

There was a definite parallelism between the changes in the bones and nerve tissues and the degree of deficiency in the diet.

The author was of the opinion that the condition was not due alone to the want of vitamin, but depended upon various factors provoked by the insufficient alimentation of proteins and mineral salts. There was an associated condition of general malnutrition, lowering of temperature, and often acidosis, with grave changes in the animal cells (partial starvation).

P. W. B-S.

MURATA (M.). **Ueber die beri-beri-ähnliche Krankheit beim Kaninchen.** [On the Beriberi-like Disease in Rabbits.]—*Virchows Arch. f. Path. Anat. u. Physiol.* 1923. Vol. 245. pp. 448–476. With 7 figs. [17 refs.]

The work was done at the Pathological Institute at Osaka. The animals were divided into three groups—(1) Free feeding on polished rice and water only. (2) Forced feeding with polished and unpolished rice. (3) Free feeding with rice, rice straw and water.

Very detailed observations on the clinical observations, weights, and post mortem findings are given.

It was found that the condition of the heart in these experimental rabbits differed very appreciably from that seen in human beriberi in that there was no hypertophy, but on the contrary marked atrophy. KURE has suggested that the hypertrophy of the heart in human beriberi is due to deficient respiration, and OHMURA has been able to show that the increase in the right heart of guineapigs could be produced by controlling the breathing by means of a band round the thorax ; the experiment lasted 100 days; both hypertrophy and dilatation were produced. In human beriberi, owing to the paralysis of the intercostals and diaphragm, and in the guineapigs from constriction by a band, respiration is hindered and the right heart becomes dilated, whereas in rabbits who are breathing freely when not disturbed, no such dilatation takes place. Thus the increase in the size of the heart is not primary, but secondary to degeneration of the nerves and muscles. In the rabbits this degeneration had not advanced far enough to hinder the breathing, and the absence of any hypertrophy of the heart in these animals should not be regarded as an important difference between the beriberi of the two types. In his conclusion he states that the disease in rabbits may be identified etiologically and also in its clinical and pathological evidences with human beriberi, although at the same time several differences were noted, and he feels justified in calling this sickness producted by rice-feeding rabbit beriberi.

P. W. B-S.

KAMIZA (Rikei). [**Beriberi-like Disease of the Mammalians arising from the Insufficient Supply of Potassium Salts and Curative Efficacy of Potassium Derivatives against Beriberi (concluded**].)—*Chugwai Iji Shimpo* (*Internat. Jl. Med.*) 1923. May. No. 1035. [Summarized in *Japan Med. World.* Tokyo. 1923. Dec. 15. Vol. 3. No. 12. p. 275.]

In instances of disease in which the clinical and pathological evidences were more like those of human beriberi than the so-called beriberi-like disease, there was an insufficient supply of potassium salts in the diet; when these were provided the clinical results were better than with other methods of treatment.

P. W. B-S.

KATSUMA (Seizo). **[On the Differences between the Attitudes taken by the Blood Platelets in Human Beriberi and Rat's Vitamin B Deficiency.]**—*Iji Shimbun* (*Med. News*). 1923. Nov. No. 1128. [Summarized in *Japan Med. World*. Tokyo. 1924. Feb. 15. Vol. 4. No. 2. p. 36.]

The differences in the blood platelet counts and the pathological appearances of the pituitary glands in human beriberi cases and in rats suffering from vitamin B deficiency disease led the author to conclude that the conditions are not identical.

P. W. B-S.

KONDO (Y.). **Contribution to our Knowledge of the Polished Rice Disease in Fowls.**—*Taiwan Igakkai Zasshi* (*Jl. Med. Assoc. of Formosa*).—1923. Nov. No. 231. English summary p. 2. [In Japanese.]

Polyneuritis due to feeding on polished rice only was produced in 17 fowls. After recovery these were several times subjected to the same dietary and it was found that (1) it took longer for the symptoms to become manifest, as if some sort of immunity had been established, or that the birds had accommodated themselves to the deficiency of the vitamin. (2) The islands of Langerhans in the pancreas during the first attack were increased in size, but not in the subsequent periods. (3) The onset of the symptoms showed an inverse ratio to the air temperature. (4) Sex had no influence on the onset or intensity of the symptoms.

P. W. B-S.

SHIMAZONO (Junjiro). **[On the Therapeutic Treatment of Serious Cases of Beriberi with Suzuki's Raw Oryzanin.]**—*Chugwai Iji-Shimpo*. 1923. Mar. No. 1032. [Summarized in *Japan Med. World*. Tokyo. 1923. Oct. 15. Vol. 3. Nos. 9–10. p. 223.]

The author treated 16 cases of beriberi with raw oryzanin (a rice bran extract). One case died, and eleven improved, but he is doubtful whether these good results were entirely due to the efficacy of the preparation.

P. W. B-S.

LIPSCHITZ (W.). **[The Action of Tyramin on Pigeon Beriberi.]**—*Hoppe-Seyler's Ztschr. Physiol. Chem.* 1923. Vol. 124. No. 3–6. pp. 194–201. With 3 figs. [Summarized in *Experim. Station Rec.* 1923. Oct. Vol. 49. No. 5. p. 462.]

Curative tests were carried out on 9 birds which had been fed for several weeks on polished rice and had well marked symptoms; 5 to 10 mgm. of tyramin were injected intramuscularly. In 5 cases (4 birds) there was distinct improvement, in 5 others no good result. As compared with vitamin preparations it had very little prophylactic power against vitamin sickness and its curative action is far less than that of the vitamin B complex.

P. W. B-S.

IKEDA (Tohkichiro). **[Studies on the Efficacious Substance in the Rice Bran Extracts against Bird's Polished Rice Disease. (1 Communication.)]**—*Toyo Igaku Zasshi* (*Jl. Oriental Med.*) 1923. Oct. Vol. 1. No. 3. [Summarized in *Japan Med. World*. Tokyo. 1924. Feb. 15. Vol. 4. No. 2. p. 41.]

The water-soluble substance effective against polished rice disease was identified as one able to facilitate the proliferation of *Saccharomyces ellipsoides* 1. It reacted to reagents like alkaloids, but no colour reactions were observed.

P. W. B-S.

SCURVY.

SCOTT (G. B.). **Naval Medical History of the War. Section of Tropical and Sub-Tropical Medicine. Part VI.—(ii) Scurvy: on Board the Russian Transport** *Dvinsk.*—*Jl. Roy. Nav. Med. Serv.* 1924. Jan. Vol. 10. No. 1. pp. 38–40.

An outbreak of scurvy amongst 618 Austrian and German prisoners and 450 Russian workmen in the Murmansk region is here recorded. Their food had consisted almost entirely of rye bread with a little reindeer meat at long intervals. Of these 1,068 men nearly everv one showed signs of scurvy and some were very advanced cases. All the familiar symptoms and signs of the disease were present. Naval Issue Lime Juice was served out from large tubs each morning, which with onions, carrots, frozen meat (and fresh air), soon restored them to health. Before reaching Archangel (a voyage which occupied 9 days) there were three deaths. A considerable number were permanently crippled from haemorrhages into the knee joints.

P. H. Manson-Bahr.

GOTTSCHALK (Charlotte). **Ueber Blutuntersuchungen beim kindlichen Skorbut.** [Blood Research in Infantile Scurvy.]—*Arch. f. Kinderheilk.* 1923. Dec. 18. Vol. 73. No. 4. pp. 244–251. With 2 text figs. [24 refs.]

The case of a rickety boy aged six months is fully described, with blood counts. The blood picture was of the pernicious anaemia type but with low haemoglobin index and a lymphocytosis. A typical condition of infantile scurvy was present with pseudo-paresis, subperiosteal haemorrhages, haematuria, X-ray bone changes, low red count (2,600,000), presence of megaloblasts, etc., and slight increase in number of the white cells. The blood condition gradually improved and in five months was normal. The local signs were then better, though the epiphyses were still indistinct. These observations are in favour of the views of von AVON that the anaemia of this disease is of an alimentary origin and the blood changes are due to a toxin which acts upon the bone marrow.

P. W. Bassett-Smith.

NEVILLE (D. W.). **A Case of Scurvy occurring in Melbourne.**—*Med. Jl. Australia.* 1924. Jan. 19. 11th Year. Vol. 1. No. 3. pp. 63–64. With 1 fig.

The case was that of an old age pensioner of 68 who had lived for many years in the city. He was very poor and had lived practically upon bread, cheese, butter and jam for the past three years. The general symptoms of scurvy were present, spongy bleeding gums, subcutaneous haemorrhages, joint pains, anaemia. The red cells only numbered 2,200,000 per cmm. and haemoglobin was 30 per cent. Antiscorbutic treatment rapidly brought about a cure.

P. W. B-S.

HESS (Alfred F.) & WEINSTOCK (Mildred). **The Catalytic Action of Minute Amounts of Copper in the Destruction of Antiscorbutic Vitamin in Milk.**—*Jl. Amer. Med. Assoc.* 1924. Mar. 22. Vol. 82. No. 12. pp. 952–956. With 4 charts. [10 refs.]

It has been previously demonstrated that the antiscorbutic vitamin is readily destroyed by oxidation especially in the presence of heat and under the action of copper. The catalytic action of the metal is brought about by very minute quantities as shown by the experiments of the authors. In cows' milk normally about 5 mgm. per litre of copper is present and in human milk about the same. Quantities of lactate of copper equal to 14, 9, 6 and 2·5 parts per million added to diluted dried milk were fed to guineapigs and produced scurvy, generally in less than a month. In the preparation of preserved foods this is of great practical importance, for if the apparatus adds to the milk small quantities of copper the results are detrimental. As the manufacture of condensed milk is carried on in vacuo there is very little destruction of the antiscorbutic vitamin in the course of the heating. When milk is pasteurized under ideal industrial conditions the danger is very small, but at other times the contaminating copper may rise to dangerous proportions, that is 2·5 mgm., or possibly less, per litre. This catalytic reaction is not limited to the reduction of the antiscorbutic factor, but has a much wider influence—acting upon the fat soluble vitamin in cream, butter, etc., and probably other foodstuffs. It is desirable therefore, to examine manufactured preparations not only chemically but by biological methods for estimation of the copper contained in them.

P. W. B-S.

LESNÉ (E.) & VAGLIANO (M.). **Le pouvoir antiscorbutique du lait condensé sucré de vieille préparation.**—*C.R. Soc. Biol.* 1924. Feb. 22. Vol. 90. No. 6. pp. 393–394. With 1 chart. [3 refs.]

Guineapigs of about 300 gm. weight fed upon a basic antiscorbutic diet were divided into three groups. To the first, 25 gm. of sweetened condensed milk in 75 cc. of distilled water was given every day, to the second 100 cc. of milk sterilized at 100°C. for 15 minutes, to the third 100 cc. of raw milk. The animals on the sterilized milk died as usual in about 18 days; the others remained in perfect health and gained weight. He asks: "Was this retention of antiscorbutic power by the heated sweetened milk due to its anaerobic state or was it due to the reducing action of the sugar?" The preserved milk remains effective for at least 15 months.

P. W. B-S.

i. ZILVA (Sylvester Solomon). **The Antiscorbutic Fraction of Lemon Juice. I.**—*Biochem. Jl.* 1924. Vol. 18. No. 1. pp. 182–185. [1 ref.]

ii. ——. **A Note on the Conservation of the Potency of Concentrated Antiscorbutic Preparations. II.**—*Ibid.* pp. 186–187. [2 refs.]

i. It was desirable to determine whether the sugar present in decitrated lemon juice had any value in the antiscorbutic action. Its removal, which must be carried out without injury to the antiscorbutic factor, was effected by fermenting the sugar with yeast in an atmosphere of CO_2, followed by filtration through a Berkefeld filter. A careful series of controlled experiments with guineapigs showed that the antiscorbutic substance was not thereby appreciably reduced. The greater part of the solid of decitrated lemon juice consists of invert sugar ; the remainder seems to be mainly nitrogenous substances.

It was also found that the fermented solution made *alkaline* N/20 and kept under strict anaerobic conditions remained active for 56 days, but kept for even 24 hours aerobically in the laboratory it was unable to delay the onset of scurvy when given in 5 cc. doses daily to guineapigs.

ii. Decitrated lemon juice, prepared as described above, was concentrated ten times, stored in the dark for five months, and then tested on guineapigs. The antiscorbutic value was maintained. When used in a case of infantile scurvy under the treatment of Dr. G. F. STILL, at Great Ormond Street Hospital, a rapid recovery followed. The treatment was very intensive ; the equivalent of 15 lemons was given to the child in the first 24 hours and of 48 lemons in all over a period of ten days.

P. W. B-S.

KAY (Herbert Davenport) & ZILVA (Sylvester Solomon). **The Alleged Specific Colour Reaction for the Antiscorbutic Factor.**—*Biochemical Jl.* 1923. Vol. 17. No. 6. pp. 872–874. [5 refs.]

In 1922 BEZSSONOFF devised a reagent which he claimed gave a specific colour reaction with the antiscorbutic factor. By employing this reaction on a large number of substances, which were simultaneously tested out on guineapigs, the authors conclude that there is such a reaction in some cases, but not in all. Lemon juice specially concentrated and active, failed to give the reaction, but a positive colour was obtained with yeast, yeast extracts and marmite. The test of BEZSSONOFF is not reliable enough to be of any use in the detection of vitamin C.

P. W. B-S.

CARIDROIT (F.). **Variation de l'excrétion azotée (azote total urinaire) au cours du scorbut expérimental.**—*C.R. Soc. Biol.* 1924. May 30. Vol. 90. No. 18. pp. 1379–1380.

In four guineapigs subjected to experimental scurvy the metabolic activity was tested by examination of the urine, which showed that these animals failed to utilize the proteins of their food but used up their own. Thus the toxic symptoms result either from the destruction of the normal anti-toxic principles or from liberated true toxins, with or without the co-operation of glandular internal secretions.

P. W. B-S.

UNDULANT FEVER.

BASSETT-SMITH (Percy). **Naval Medical History of the War. Section of Tropical and Sub-Tropical Medicine. Part IV. Mediterranean or Undulant Fever.**—*Jl. Roy. Nav. Med. Serv.* 1923. Oct. Vol. 9. No. 4. pp. 278–285. With 4 charts & 1 fig.

In 1904 there were 430 cases of undulant fever in the Navy, with 28,458 days' sickness and nine deaths; but owing to the compulsory sterilization of all fresh milk in the service in 1907 this was reduced to twelve cases.

At the commencement of the Great War the importance of maintaining all precautions against the ingestion of infected milk and foods was emphasized by a special order, and no very great increase of the disease was noted. In all there were 88 cases, of which 19 were in Maltese and 6 in French, reducing the British cases to 63 for five years, or an average of 12·8 a year, with one death. Four cases were recorded from the East Indies, all in Maltese, and one from Bermuda.

The resemblance between *Micrococcus melitensis* and *Bacillus abortus* is a very close one and the serum of a Mediterranean case of undulant fever agglutinated abortus up to 1 : 2,000. In fifty cases the fever was remittent, and hyperpyrexial in five; rheumatic-like pains and neuritis were recorded in thirteen; bronchitis in two; tachycardia in two; epistaxis in one; mental symptoms in two.

In fourteen cases goat's milk was the source of infection, in one, cow's milk. In one case the organism was obtained by blood culture, the disease lasting eight months. One death occurred from dementia; at the autopsy the spleen, liver and kidneys were all enlarged; the appendix was gangrenous. There was one case of "paramelitensis fever" from the Adriatic; the blood agglutinated *M. melitensis* 1 : 100 and *M. paramelitensis* 1 : 2,000.

P. H. Manson-Bahr.

JEAN & SEDALLIAN (P.). **Notes étiologiques relevées à propos d'une endémie de fièvre de Malte observée dans une région du Gard.**—*C.R. Soc. Biol.* 1924. May 30. Vol. 90. No. 18. pp. 1435–1436.

In the district of Lussan during the past four years the authors have observed 65 cases of undulant fever, occurring mostly in the spring, in 14 villages among a population of 3,000 inhabitants. (An epizootic with abortion was present in the goats and sheep.) In 19 of the cases, the consumption of milk or cheese was the cause; 46 of the others were probably due to a more or less close association with the infected animals or their excreta, but not due to ingestion of the organisms. The epidemics in the animals were generally very much localized, and it is stated that the owners themselves had restricted the sale of new animals and had continued breeding with the old herd, which had become spontaneously vaccinated.

P. W. Bassett-Smith.

MARTEL (H.), RENAULT (J.), CESARI (E.) & LÉVY (P. P.). **Sur la transmission de la fièvre méditerranéenne par les troupeaux ambulants de chèvres laitières.**—*Bull. Acad. Méd.* 1924. May 27. Year 88. 3rd Ser. Vol. 91. No. 22. pp. 671–676.

The authors show that the endemic centres of undulant fever in France are now widely scattered; in fact, they are co-existent with the areas where goats are in use. The goats are brought down from the country to the towns and milked in the streets, and thus the infection is spread by the consumption of the raw milk.

They give details of a small outbreak, personally observed, where the infection of human cases from goats was bacteriologically proved; the herd goats showed no external evidences of infection and no history of abortions was obtained, but the serum of 14 showed a fairly high agglutination titre, and from the milk of one a number of suspicious colonies were grown. The herd was isolated, the milk was interdicted and the infected goats destroyed; but the authors state that since the difficulties and uncertainties of diagnosis in animals are so great the only certain safeguard is to boil the milk.

P. W. B-S.

MAGNANI (G.) & MORANDI (S.). **La febbre di Malta in Romagna.**—*Policlinico.* Sez. Prat. 1924. Feb. 11. Vol. 31. No. 6. pp. 182–185. [7 refs.]

Two clinical types of undulant fever are met with in this district. One is severe, the other is a mild, ambulant form of insidious onset. In neither is the typical chart presented, with alternating pyrexial and apyrexial periods lasting for days. There are profuse sweats, but no rigors or rheumatic pains, no orchitis, arthritis, or any of the usual complications. The mild form yields to serum treatment—20–30 cc. every 8 to 12 hours for 3 or 4 doses. Those with more persistent fever react better to vaccines in doses sufficient to produce a marked reaction. The disease spreads from the flocks to the shepherds, who are practically the only sufferers; 2·5 per cent. of the sheep and goats were found to be infected.

H. Harold Scott.

BÉGUET (M.). **L'agglutination des** *Brucella melitensis* **et le sérodiagnostic de la fièvre ondulante. Causes d'erreur et précautions nécessaires.** —*Bull. Soc. Path. Exot.* 1924. Feb. 13. Vol. 17. No. 2. pp. 110–114. [8 refs.]

The author used for his researches 17 sera from rabbits inoculated with *M. melitensis* and 3 with *B. abortus* and 7 from cases of undulant fever. These were tested with 17 strains of *M. melitensis* and 3 of *B. abortus*. The essential factors are the agglutinative powers of the serum and the agglutinability of the organism. The specific characters of the serum were found to vary not only in the different stages of the disease, but in each individual serum; these also varied remarkably with the strain used for immunization. Heating the serum at 56° for 30 minutes generally lowered the agglutinating power both before and after dilution; occasionally the reverse was noted, which is comparable with the paradoxical reactions found in various dilutions. The same was the case with *B. abortus*.

Non-specific agglutination was found in dilutions from 1–20 to as high as 1–500 in 142 out of 150 sera of other diseases; after heating the serum it was nil to 1 in 50, rarely present to 1–300. Further experience is required to determine how much this non-specific agglutinability depends upon age and methods of culture.

It is therefore necessary to employ for serum diagnosis of undulant fever only such strains of *M. melitensis* as prolonged experience has shown to be non-agglutinable at 1 : 20 by the non-specific substances in human blood, and sensitive to the specific antimelitensis factors. If such strain be used with heated and unheated serum in dilutions between 1–20 and 1–500 the positive results may be considered reliable.

P. W. B-S.

DOMINGO (Pierre). **Etudes sur la fièvre de Malte. Action de la bile sur l'agglutinabilité du** *Micrococcus melitensis.*—*C.R. Soc. Biol.* 1924. Mar. 28. Vol. 90. No. 11. pp. 824–825.

In the belief that the variations in the amount of agglutinability of particular strains of *M. melitensis* depend upon some change in the envelope of the organism, methods were taken to overcome this. It was found that treatment of the emulsion with ox bile gave satisfactory results both in increasing the action of specific agglutinins and in decreasing that of the non-specific ones. A very strong emulsion of the organism is made from a culture grown for 3 days on peptone agar, or better, placenta agar having a reaction of PH 7·6. This emulsion is mixed in proportion of 1 part to 9 with sterilized, filtered ox bile, remains in contact 24 hours and is well shaken 3–4 times. It is then centrifuged for 30 minutes. The sediment is emulsified in sterile saline solution to the degree of opacity required for the usual strength to carry out tests after filtration through cotton wool, and if to be kept 0·4 per cent. formalin is added. Thus treated, *M. melitensis* which have lost their agglutogenic powers have regained them, up to 1 : 850, and if low before treatment these have been raised from 1 : 15 to 1 : 750. In one strain tested the action of non-specific serums was cut out altogether. It is stated that by this method the *B. abortus* of BANG may probably be differentiated from the *M. melitensis.*

P. W. B-S.

DE BLASI (Dante). **Fenomeno paradosso e zona intercalata d'inibizione parziale in un siero agglutinante antimelitense.** [The Paradoxical Phenomenon and the Zone of Partial Inhibition in an Antimelitensis Serum.]—*Ann. d'Igiene.* 1923. Nov. Vol. 33. No. 11. pp. 765–770. [10 refs.]

By the "paradoxical phenomenon" is implied the failure of a serum to agglutinate in low dilution although its power in high dilutions is retained. A specimen of blood was sent from Nardo for a Wassermann test and for agglutination with *M. melitensis.* The blood was partially laked on arrival. The Wassermann reaction proved positive; agglutination was well marked in a dilution of 1 : 3,200 but negative in 1 : 100. A week later the following results were obtained from the same serum :—

Dilution of serum	*Agglutination.*	*Dilution of serum.*	*Agglutination.*
1 : 3,000	+ + +	1 : 5,250	+
1 : 4,250	+ + +	1 : 5,500—6,000	+ + +
1 : 4,500	+ + +	1 : 6,250	+ +
1 : 4,750	+ +	1 : 6,500	—
1 : 5,000	±		

The author briefly discusses this phenomenon, regarding it as possibly analogous with the flocculation of aqueous suspensions of lecithin by magnesium sulphate which also gives irregular results, and thinks that the laking may have played some part.

H. Harold Scott.

BURNET (Et.). **Essais de diagnostic de l'infection à *M. melitensis* chez la chèvre par inoculation de mélitine. Réactions irrégulières.**—*Arch Inst. Pasteur de Tunis.* 1924. Apr. Vol. 13. No. 1. pp. 1–6. [2 refs.]

Further experiments were made by the author to determine the value of the intra-dermal " melitine " reaction as a diagnostic method for goats. Out of 645 tested, 85 (13 per cent.) reacted, and only 37 (5·7 per cent.) gave positive serum reactions. If divided into 3 groups, 2·5 per cent. gave simultaneously both reactions, 9·5 reacted to the " melitine " but not to the serum tests, and 3 per cent. gave agglutination but no filtration reactions. The tests are thus not in agreement. It is quite possible that the intra-dermal method might be more delicate than the agglutination test, but the failure in 3 per cent. when the serum tests were positive renders the method unreliable as a practical prophylactic procedure for the examination of goats.

P. W. B-S.

FORNACA (L.) & BUA-FAZIO (F.). **L'intradermoreazione per la diagnosi di febbre melitense.**—*Riforma Med.* 1924. Apr. 28. Vol. 40. No. 17. pp. 393–394.

The authors describe an intradermal test for the diagnosis of cases of undulant fever. The material employed is a 6–8 day culture of *M. melitensis* on ordinary agar. A loopful of this (No. 1 loop by Caplewski's scale) is emulsified in 2 cc. of " physiological serum " [? saline] and heated for 10 minutes in a water-bath at 100° C. ; when cooled, to each 10 cc. of the emulsion is added one drop of phenol. It is estimated that there are 2 million organisms per cc. ; 0·5 c.c is injected for the test. In positive reactions a vesicle develops in 40–60 minutes ; in 8–16 hours there is a red area the size of a sixpenny-piece with surrounding oedema and infiltration. This reaction begins to fade in 24–48 hours and has quite disappeared in 5–7 days. The control site (with normal saline and a drop of phenol to each 10 cc.) may show slight reddening which passes away in 48 hours.

The test has been carried out on eight cases of undulant fever proved by agglutination and blood-culture, on 50 patients suffering from other diseases and on 16 healthy subjects. The last two classes gave negative results. Among the other diseases were typhoid and paratyphoid B fevers, acute articular rheumatism, pulmonary tuberculosis in various stages, malaria, pneumonia, erysipelas and syphilis.

H. Harold Scott.

NATTAN-LARRIER (L.). **[The Diagnosis of Mediterranean Fever.]**—*Clinique et Laboratoire.* 1923. Dec. 30. p. 249. [Summarized in *Brit. Med. Jl.* 1924. Apr. 12. (Epitome) p. 56.]

The frequency of cases of undulant fever in France necessitates a better knowledge of the diagnostic methods. The author emphasizes the importance of the following.—(1) Agglutination reaction. (2) Blood culture. (3) Intradermal method. This latter is described in more detail, and is said to be more simple to perform and more constant in its result than the others. It should be of real value to clinicians in cases of unexplained pyrexia, though the reaction does not become positive till the seventh to eleventh day.

P. W. B-S.

AMABILE (Luigi). **Ricerche sul valore della sieroreazione di Wright—o sieroagglutinazione per il micrococco di Bruce—nella tuberculosi.** [Agglutination of *Micrococcus melitensis* by the Serum of Tuberculous Patients.]—*Riforma Med.* 1924. Mar. 10. Vol. 40. No. 10. pp. 217–219. [5 refs.]

Records have been published from time to time stating that the serum of tuberculous subjects has an agglutinating action on *Micrococcus melitensis*, often in high dilution. The author carried out the test with 86 sera in dilutions varying from 1 in 60 to 1 in 1,000 on four strains of the organism. Only one yielded a positive result and from the blood of this patient the *M. melitensis* was subsequently isolated. The test, therefore, appears to be specific.

H. Harold Scott.

PISANI (S.). **La forma pseudo-tubercolare della febbre di Malta.**—*Riv. Crit. di Clin. Med.* 1924. Feb.. 15. Vol. 25. No. 5. pp. 113–129. [10 refs.]

Under the name of " Mediterranean phthisis " a condition has been recognized for years in some respects resembling tuberculosis of the lungs, but which clears up in course of time. It is characterized by irregular fever, dyspnoea, cough, dissociation of the pulse-temperature ratio, and loss of weight. The author met with 15 such amongst 75 cases of undulant fever, and he gives details of ten. In several the physical signs were limited to the apical regions and were very suggestive of tuberculosis, but the bacillus was not found. The difficulty of diagnosis is rendered greater because in undulant fever the organisms may not be obtained from the blood and the agglutination-titre of the serum may be low, whereas, on the other hand, some cases of pulmonary tuberculosis are said to cause agglutination of the *M. melitensis* and the tubercle bacillus may not be discovered. The failure to agglutinate the organism in undulant fever cases, however, is only a transient phenomenon and a repetition of the test will almost certainly give a positive result.

H. Harold Scott.

D'OELSNITZ & LIOTARD. **Quelques essais d'autosérothérapie périodique de la fièvre de Malte.**—*Bull. et Mém. Soc. Méd. Hôpit. de Paris.* 1924. Apr. 17. Year 40. 3rd Ser. Vol. 48. No. 14. pp. 548–555. With 2 charts in text. [1 ref.]

The various methods of treatment of undulant fever by chemicals, vaccines, autogenous blood and serum have to a great extent proved unreliable. The authors tried a method which they call "periodic autotherapy or autoserotherapy of convalescence." The blood is taken from a patient soon after the end of a pyrexial wave, when the antibodies are supposed to be most abundantly present, the serum is separated, heated at 56° C. for one hour and then injected subcutaneously in doses of 5 cc. for an adult or 2–3 cc. for a child, at the next pyrexial period, every day or alternate days and repeated as required. In the first case reported as much as 60 cc. were given; five cases in all were treated and the charts of two are inserted. The results, as the authors say, are uncertain, useless in some, doubtful in others, but though the effect on the length of the pyrexia is indefinite, yet the effect on the general condition was often favourable. Without observations on a very much larger number of cases no definite deductions can be made. With regard to the mode of action of the serum it is possible that the results are due to the introduction of foreign proteids and are not dependent on specific antibodies at all, which are frequently deficient in this disease. They found that the agglutinating titre was of no prognostic value. The blood counts showed considerable irregularity, but in general there was a marked degree of leucopenia.

[In very anaemic and cachectic cases one would rather shun the abstraction of such large quantities of whole blood for the sake of a problematic improvement.]

P. W. B-S.

HALBRON (Paul). **Etude pratique du diagnostic et du traitement de la fièvre méditerranéenne.**—*Rev. Prat. Malad. des Pays Chauds.* Paris. 1923. Aug.–Sept. 2nd Year. Vol. 3. pp. 5–20. [7 refs.]

The author gives a very readable and interesting description of the clinical characters of undulant fever, emphasizing the difficulties of diagnosis, and the usual inability of treatment to cut short the disease. In one case of his own, treated with various forms of melitensis vaccine, no benefit was observed, but after the inoculation of a different strain of vaccine there appeared to be "shock" symptoms and the case then improved. [It is however, universally accepted that in this fever no generalizations can be made from a single case. The paper contains no new information.]

P. W. B-S.

SÉE (Pierre). **La question de la fièvre de Malte et de son traitement. Revue des travaux récents.**—*Gaz. des Hôpit.* 1924. Mar. 22. Vol. 97. No. 24. pp. 401–404. [27 refs.]

An interesting review of some recent work; contains nothing original.

P. W. B-S.

TYNDALE (W. R.) & VIKO (L. E.). **A Fatal Case of Malta Fever.**—*Jl. Amer. Med. Assoc.* 1923. Dec. 8. Vol. 81. No. 23. p. 1953.

While investigating an epidemic of Malta fever in the goats of South Utah, the State Veterinarian contracted the fever, probably by inoculation from handling the placenta of one of the goats. The fever developed 12 days after, and exhibited a series of definite waves; death occurred about two months after the onset. In this case, however, there was antecedent organic heart disease. *M. melitensis* was isolated from the urine during life, and after death from the spleen. In 1922 two goat herds in the district were reported to have died from a disease said to resemble this.

[No mention is made whether infection of *B. abortus* was excluded.]

P. W. B-S.

KOOSE (Werner). **Eine Laboratoriumsinfektion mit Maltafieber.**—*Cent. f. Bakt.* 1. Abt. Orig. 1924. Apr. 30. Vol. 91. No. 7–8. pp. 493–496. With 1 chart in text. [10 refs.]

A case of laboratory infection with the Kral strain of *M. melitensis*. The incubation was nine days, the course of the case typical but mild. Vaccine treatment was used, commencing with 10 millions and working up to 300 millions.

P. W. B-S.

CASTORINA (Giuseppe). **Un caso di infezione associata paratifo B-melitense.**—*Pediatria.* 1924. Jan. 1. Vol. 32. No. 1. pp. 44-46. [3 refs.]

Case of an infant, 16 months old, at Messina. A blood count gave red cells 3,000,000, white cells 1,800, haemoglobin 50 per cent.; the serum agglutination tests were 1 : 500 for *M. melitensis*, 1 : 500 for paratyphoid B. A blood culture was not made. The symptoms and signs were: diarrhoea, irregular remittent fever, sweats, and a large spleen; there was no eruption. The illness lasted three months and ended in perfect recovery. Antityphoid and melitensis vaccines were used.

[Mixed infections were not infrequently seen in hospital cases before undulant fever was eradicated from the Navy, and the author quotes nine cases in infants from Italian authors.]

P. W. B-S.

D'OELSNITZ, DEGROOTE (G.) & PIN (F.). **Un cas de fièvre de Malte à forme fruste.**—*Bull. et Mém. Soc. Méd. Hôpit. de Paris.* 1924. Jan. 31. Year 40. 3rd Ser. Vol. 48. No. 3. pp. 67–70. With 1 chart in text.

The authors describe a mild case of undulant fever, lasting about a month, in a man aged 24. The diagnosis was proved by serum agglutination and by blood culture. Only symptomatic treatment was employed. The infection was traced to repeated ingestion of fresh white cheese made from ewe's milk [this is not stated to have been confirmed experimentally]. The occurrence of such mild forms far from the recognised endemic areas should be carefully considered in diagnosing any case of rather prolonged fever.

P. W. B-S.

CASTORINA (G.). **Un caso di infezione da m. melitense con manifestazioni emorragiche.**—*Pediatria.* 1924. June 1. Vol. 32. No. 11. pp. 680–682. [3 refs.]

An interesting case of undulant fever in a child, 3½ years of age, who had been fed, after the first 12 months, on unboiled goats' milk. After a few days' fever there was a profuse epistaxis and punctiform subcutaneous haemorrhages over the whole body surface, more intense on the lower limbs. A vaccine of *M. melitensis* led to a disappearance of the fever and the haemorrhagic spots cleared up. Forty days later there was a return of fever and rash, accompanied this time by transient oedema of the eyelids, hands and feet. 20 cc. of the father's serum was injected and the symptoms again disappeared. There was no concurrent disease, but, as the author remarks, the rash was strongly suggestive of typhus.

H. Harold Scott.

i. BURNET (Et.) & ANDERSON (Ch.). **Importance de la mammite chez les chèvres porteuses de** *M. melitensis.*—*C.R. Acad. Sci.* 1924. Jan. 21. Vol. 178. No. 4. pp. 428–430.

ii. ——& —— **Observation et autopsie de quelques chèvres naturellement porteuses de** *M. melitensis.* **Importance de la mammite.**—*Arch. Inst. Pasteur de Tunis.* 1924. Apr. Vol. 13. No. 1. pp. 7–18. [3 refs.]

i. The authors found that they could rarely isolate the *M. melitensis* from the blood of goats when the milk was infected with the organism. They therefore sought some local centre from which it could pass easily into the milk. Six infected goats were examined, and in only one was there a severe infection of the breasts. Among the five others, all naturally infected, the *M. melitensis* was found in the mammary glands and around. In the "carrier" goats the microbic centres are *par excellence* in the lymphatic glands around the infected mammary gland. In four of the goats, in lactation with infected milk, macroscopic and microscopic evidence was found in the mammary glands of inflammatory lesions. A specific mastitis appears to be the essential fact in a natural infection of goats with the *M. melitensis.*

ii. Most careful pathological and bacteriological examinations were made upon a number of goats naturally and artificially infected with *M. melitensis,* of which the following results are given.

(1) There is no relation between the general health of the goat and the melitensis infection.

(2) The temperature of the infected goats is nearly always normal and gives no indication of the infection.

(3) Amongst the infected goats, agglutination and blood and milk cultures give very inconstant results, and even when the animal is heavily infected the agglutinins may be absent.

(4) Even after very heavy experimental inoculations the blood may remain sterile.

(5) With the infected goats the serum, subcutaneous and thermal reactions are very uncertain and of little diagnostic value.

(6) There is no constant relation between the infected goat and the leucocyte content in the milk.

(7) It is remarkable that a goat inoculated and reinoculated with strong doses of *M. melitensis* is so easily able to destroy or eliminate the virus and that this is only found in the lymphatic glands.

(8) The conclusion formed from these and previous observations is that "the mastitis is the essential factor in goats suffering from a *M. melitensis* infection."

From these observations upon infected animals the authors show that in goats the infection quickly becomes localized and is practically limited to the mammary regions instead of being a widespread septicaemia as has been generally described in man and other infected animals. According to ZAMMIT the infection is abundant and persistent. [It would be interesting to note in these Tunisian goats where the organism becomes localized in male animals.]

P. W B-S.

SDRODOWSKI (P.). **Maltafieber in Aserbeidshan.**—*Arch. f. Schiffs- u. Trop.-Hyg.* 1924. Jan. Vol. 28. No. 1. pp. 2–7. With 5 charts. [2 refs.] and *Rev. Microbiol. et Epidémiol.* Saratov. 1923. Vol. 2. Nos. 3–4. In Russian pp. 1–25. With 3 charts. [25 refs.] German summary pp. 101–102.

It is pointed out that infection in the guineapig with the *M. melitensis* is very like that seen in man, whereas in the rabbit it is more chronic without special characters except serum reactions and is analogous to what is found in the goat.

In the human cases the *M. melitensis* was found in the blood, urine, and pus, and was strongly agglutinated with the patients' serum, 1 in 200 to 1 in 3,000; in 150 cases of other diseases used as controls the agglutination was never above 1 in 100, and this was taken as the minimum dilution. From his animal experiments the author considers it possible that the Caucasian microbe is a biological variety of *M. melitensis*, Bruce, and should be placed in the para-melitensis and *B. abortus* group.

It is noted by the editor of the German version that rabbit serum derived from an animal inoculated with this Caucasian type and sent to Hamburg, though three months on the road, gave good agglutination up to 1 in 3,000 with the stock *M. melitensis.*

P. W. B-S.

MARICH (F. Rizzo), SULTANA (Alexander) & MIFSUD (Victor J.). **Research on the Active Immunization of Goats against** *Micrococcus melitensis* **Infection by Means of a Prophylactic Vaccine.**—6 pp. 1921. Malta: Govt. Printing Office.

Some very carefully organized investigations on the immunization of goats by prophylactic vaccines were carried out by the authors. Great care was taken to utilize clean goats with a sufficient variety of recently isolated, virulent strains of *M. melitensis*, and also one of *M. para-melitensis*. The experiments were divided into two series, with large doses of unheated and heated vaccines respectively. The authors used first a strong dose for the inoculation test, and later one with half the amount; in both instances the prophylactic power of the vaccines was unsatisfactory, no complete immunization being produced. Very full tables give the details of the experiments. As the vaccines used did not immunize the goats against the experimental infections the authors conclude that the method is unlikely to be of practical utility.

[These results are disappointing in view of the work done on the same lines by Prof. VINCENT, which in France is considered to be of great practical importance.]

P. W. B-S.

BEVAN (L. E. W.). **Infectious Abortion of Cattle and its Possible Relation to Human Health.**—*Trans. Roy. Soc. Trop. Med. & Hyg.* 1922. Jan. 19. Vol. 15. No. 7. pp. 215–231.

At a meeting of the Southern Rhodesia Veterinary Association in Nov. 1921 the author read a very important paper on the danger to animals and man through infection with *B. abortus* Bang. The abortus disease was first epidemic at Salisbury in 1906, and at the date of the paper was said to be prevalent in cattle belonging to both Europeans and natives throughout the country. This not only affects the population economically, but there is definite evidence that the disease is spread from the cattle to mares, swine, sheep and goats; moreover, it may affect man. Full value is given to the fact that in the many endemic areas all over the world where the abortus disease is common in cattle, undulant fever in man is rarely or never found; even in the Marandellas district where the abortus infection had been prevalent since 1914 it was not until 1921 that suspected human cases were notified. In his description of the relationship of the organism in its cultural and serum reactions to *M. melitensis* the author agrees with EVANS and MEYER. He suggests that there are different strains of *M. melitensis*, and it is conceivable that there may be a certain overlapping of strains of the two organisms. The clinical and pathological characters of the disease in animals are well described, and in infected guineapigs the peculiar tubercular-like condition of the spleen is noted as has recently been reported by BURNET.

The common sources of infection are given and the methods for prevention which have been recommended and put into practice are detailed, chiefly vaccination to produce immunity, and the destruction of heavily infected animals. At first a devitalized heated vaccine was used, but this has been replaced by a non-heated vaccine sterilized with chloroform, devised by the author.

The conclusions arrived at are so clearly expressed that they are here quoted in full :—

"1. The disease known as infectious abortion of cattle, which exists in Southern Rhodesia, is caused by the *B. abortus* of BANG, and serological tests indicate that it is identical with the specific abortion of cattle in other parts of the world.

"2. The *B. abortus* of BANG bears a close morphological and biological resemblance to the *M. melitensis*. Serological tests also indicate a close affinity, in that certain strains of *M. melitensis* can be agglutinated with serum from cattle infected with infectious abortion, and strains of *B. abortus* can be agglutinated by serum from human patients suffering from undulant fever.

"3. The characteristic symptom of undulant fever in goats and sheep is abortion.

"4. Certain cases presenting symptoms resembling undulant fever have occurred in Southern Rhodesia in men who, as far as is known, have not obtained infection from goats, but have resided on farms where animals are or have been infected with infectious abortion.

" 5. It is suggested that these cases are suffering from an infection caused by the *B. abortus* of cattle.

" 6. It is also suggested that human females may contract infectious abortion through the ingestion of the organism in milk and dairy products from infected cows.

" 7. Although infectious abortion is prevalent in other parts of the world where goat's milk is not used for human consumption, it has not been accused of causing the symptoms of undulant fever in man, nor has it been proved to cause abortion in human subjects.

" 8. Although infectious abortion has prevailed in the Marandellas District for many years, it is only within the last few months that cases resembling undulant fever in man have been recorded.

" 9. While circumstantial evidence points to the infection of man by the *B. abortus* of BANG, and scientific tests up to a point support this suspicion, the final proof is not yet available.

" 10. If infectious abortion of cattle is essentially a bovine disease, a grave responsibility attaches to the Veterinary Department; and if this disease is communicable to man, a hearty co-operation between the medical and veterinary professions is necessary in dealing with it."

P. W. B-S.

BEVAN (L. E. W.). **Malta Fever and Epizoötic Abortion.** [Correspondence.]—*Lancet.* 1924. Apr. 26. p. 873. [1 ref.]

The author very rightly claims priority for the suggestion that *B. abortus* is able to cause human as well as animal infections. Further experience has demonstrated that cases simulating undulant fever are now not uncommon in Rhodesia and occur sporadically, generally one in a family, which does not favour the idea of ordinary milk infection. The cases of pyrexia are probably often very mild and only detected by their after agglutination reactions, as suggested by EVANS.

P. W. B-S.

ORPEN (L. J. J.). **The Connection between Undulant (Malta) Fever and Contagious Abortion.**—*Trans. Roy. Soc. Trop. Med. & Hyg.* 1924. Feb. 21. Vol. 17. No. 8. pp. 521–524.

——. **A Note on the Connection between Contagious Abortion and Undulant (Malta) Fever in Rhodesia.**—*S. African Med. Rec.* 1924. Feb. 23. Vol. 22. No. 4. p. 75.

Both infectious abortion in cattle and undulant fever in man are present in Rhodesia, and it was thought that the two might be due to the same organism. The micro-organism was isolated from human cases. With the different organisms and specific serum prepared from European and Rhodesian cases of undulant fever and of *B. abortus* a series of absorption tests were carried out. These showed that the European *M. melitensis* and *para-melitensis* could be distinctly divided from the Rhodesian melitensis and abortus, and that the two latter are identical. The question arises, why has the usually non-pathogenic *B. abortus* become pathogenic to man? Is it by passage through certain animals that the virulence has been raised? The author places the *M. melitensis* of Europe and Rhodesia with the *B. abortus* in one genus, which produces an undulant fever in man under favourable conditions.

He finds also that the Rhodesian organism is closely related to certain members of the coli-typhoid group, especially to *B. faecalis alcaligenes.* [The conditions that are present in parts of America are in many ways analogous to those found in South Africa.]

P. W. B-S.

EVANS (Alice C.). **Malta Fever. Cattle suggested as a Possible Source of Infection, following a Serological Study of Human Serums.**—*Public Health Rep.* 1924. Mar. 14. Vol. 39. No. 11. pp. 501–518. [33 refs.]

It has been shown that simple agglutination tests will not differentiate between the melitensis and abortus varieties of *Br. melitensis* (Evans) and that there are many instances known where goat's milk as a source of infection could not be traced and cow's milk seemed the more possible origin. The author discusses this, and quotes a case in which the infective organism was believed to be of the bovine type. The titre of agglutination necessary for a positive finding is also discussed. Human serum from 500 patients suffering from a variety of diseases other than undulant fever were tested with melitensis antigens, with the following results :—43 were positive with 1 : 5 dilution, 11 with 1 : 10, 2 with 1 : 20, 2 with 1 : 40, and 1 with 1 : 320. Inactivating the sera did not reduce these totals. It would seem then that 3 out of 500 should be classed as cases of undulant fever (past or present) and 2 others with 1 in 20 as doubtful. [The reviewer would not accept the lower dilutions.] It must be always recollected that in some cases the agglutinative response may be almost absent, and a negative laboratory finding does not therefore negative undulant fever. The author suggests that all these 58 positive serum reactions were produced as a response to *B. melitensis* ingested in raw cow's milk, although such an infection may not necessarily have caused appreciable illness.

P. W. B-S.

KEEFER (Chester S.). **Report of a Case of Malta Fever originating in Baltimore, Maryland.**—*Bull. Johns Hopkins Hospital.* 1924. Jan. Vol. 35. No. 395. pp. 6–14. With 1 chart. [55 refs.]

A case of fever of undulant type occurred at Baltimore, in which blood culture demonstrated an organism of the Melitensis type giving by absorption tests the characters of *B. abortus.* The source was thought, though not proved, to be bovine rather than caprine. The patient was treated with specific vaccine given repeatedly over a prolonged period without any benefit. The details of the case are very well reported; the terminology of EVANS is used for the organism (*Brucella melitensis* var. *abortus*). As this is the first recorded case of a disease in man of undulant fever type due to an organism of the abortus group, it is of very considerable importance and interest.

[The serum of this case was used by EVANS in a series already reported on, and in the absorption experiments was one of the two human sera which were placed in the group *Br. Melitensis* A. (*Brucella melitensis-abortus*) with bovine and porcine strains. With *M. melitensis* the patient's serum gave positive agglutination to a titre of 1 in 20.]

P. W. B-S.

AURICCHIO (Luigi). **Richerche sul'laffinità tra** *B. abortus* **e** *B. melitensis.* **Tentativi d'immunoterapia con** *B. abortus* **nell'infezione da** *B. melitensis* **nell'infanzia.** [Researches on the Relations between *B. abortus* and *B. melitensis.* Experiments in the Treatment of Melitensis Infection in Childhood with *B. abortus.*]—*Pediatria.* 1924. Jan. 15. Vol. 32. No. 2. pp. 57–68. [16 refs.]

Four lines of research were carried out :—1. Agglutination, complement fixation and the intradermal reaction were tested with *B. abortus* antigen in children to whom had been administered melitensis vaccine : 2. The reverse of the last—the results with *melitensis* antigen in children vaccinated with *B. abortus* ; 3. Reactions with *abortus* antigen in children spontaneously infected with *B. melitensis* ; 4. Treatment of *melitensis* infected children with *B. abortus* vaccine.

For the agglutination and complement fixation tests suspensions in normal saline of a 24 hours' culture of the organism on agar were employed. For the intradermal reactions suspensions of bacterial proteins—" abortina " or " melitensina " respectively—obtained by the methods of FLEISCHNER and MEYER. 0·002 mgm. in 9·1 cc. normal saline gave a distinct reaction, and even less would at times suffice.

Of six healthy children three were vaccinated with *B. melitensis* and three with *B. abortus.* Treatment of melitensis infection by *B. abortus* was carried out in 15 instances. For the third object of research tests were performed on 18 children.

Briefly, the results of the first two lines of research proved positive in all instances. As regards the third, in children with undulant fever, the results were not always the same. The intradermal reactions showed no difference, but the serum tests with *B. abortus* were more definite and constant than with the melitensis organism. Cases of undulant fever rapidly yielded to treatment with abortus vaccine, quite as well as with one of melitensis. The following facts, however, that anti-melitensis serum agglutinated *B. melitensis* and *B. abortus,* that anti-paramelitensis serum agglutinated *B. paramelitensis* and *B. abortus,* while anti-abortus serum agglutinated all three without distinction, show that from a serological point of view the *B. abortus* has a less differentiated antigenic action than *B. melitensis,* and, though the organisms are very closely allied, the results do not warrant their being considered as identical.

H. Harold Scott.

KHALED (Z.). **A Comparative Bacteriological Study of Bovine Abortion and Undulant Fever.**—*Jl. of Hyg.* 1924. Mar. Vol. 22. No. 3. pp. 335–342. [5 refs.]

The author confirmed his previously reported experiment that intravenous inoculations of *B. abortus* were able to protect a monkey from subsequent infection with *M. melitensis* [see this *Bulletin,* Vol. 19, p. 351]. Further experiments on these lines with two goats showed that a solid immunity could be conferred on the animals by inoculation of an organism of low virulence (*B. abortus*) against one of high virulence, *M. melitensis.* The immunized goats appeared well, but gradually ceased to give milk ; the control animal showed marked constitutional symptoms and acute mastitis. Post mortem the organism was not recovered from the immunized animals and there were no pathological changes. In the control animal the *M. melitensis* was recovered repeatedly from the blood and milk before death, and was isolated also at the autopsy.

These results being so definite, the use of a vaccine made from *B. abortus* was indicated for treatment of undulant fever cases, as it would be possible to administer much larger doses of the antigen than of the more toxic *M. melitensis*. Three cases so treated are reported, and the results are encouraging, the dose varying from 500 million to 2,000 million per cc.

[Though the number of cases treated is very small, the practice may be of great utility. In the case reported by KEEFER the autogenous *Br. melitensis abortus* vaccine was not successful.]

P. W. B-S.

BURNET (Et.). **Le microbe de l'avortement épizootique** (*B. abortus*) **vaccine l'homme et le singe contre le microbe de la fièvre méditerrananéenne** (*M. melitensis*).—*C.R. Acad. Sci.* 1924. Jan. 2. Vol. 178. No. 1. pp. 154–156. [1 ref.]

In five experiments, previously reported, the author has shown that *B. abortus* is not pathogenic to man ; in two experiments now described he proves that it is not pathogenic to Macacus monkeys but that living cultures of *B. abortus* are able to vaccinate (protect) man and monkey against undulant fever.

P. W. B-S.

DENGUE, PAPPATACI AND UNCLASSED FEVERS.

TASCON (Jorge H.). **El dengue en Buga.**—*Repert. Med. y Cirug.* Bogota. 1924. Feb. Vol. 15. No. 5. (No. 173.) pp. 242–251.

Buga is 1,001 metres above sea-level; the temperature varies between 18° and 32° C. During 1923 some 70 per cent. of the 18,000 inhabitants were attacked by dengue. Accurate figures are not obtainable because the disease is not notifiable. The incubation period proved to be about five days. The cases were of average severity and there were no deaths. In some the gastro-intestinal manifestations were marked—severe, intractable vomiting, occasionally black vomit, diarrhoea and abdominal pain. A few patients exhibited dyspnoea and precordial pain and there was a tendency to haemorrhage.

The author states that the disease should be made notifiable because it is usually the precursor of epidemics of yellow fever. This is significant in view of the previous statement that two of the patients had haematemesis towards the later stage of the illness.

[There appears to be some doubt as to the diagnosis of these cases.—P. W. B-S.]

H. Harold Scott.

DE SOUSA (Domingos Roque). **A epidemia da Dengue na India Portuguesa.**—*Bol. Ger. Med. e Farmacia.* Bastora. 1924. Jan. Vol. 9. No. 1. pp. 11–12.

This is a brief record of an epidemic of dengue in Pangim which prevailed from June to November [? 1923], attaining its height from the middle of August to the end of September. About half the population was attacked, but the spread was not so rapid as in previously reported epidemics. In some instances 10 to 25 days would elapse between two cases in the same family. There were no fatalities.

H. Harold Scott.

DUVAL (Charles W.) & HARRIS (William H.). **Studies upon the Etiology of Dengue Fever: Preliminary Report.**—*Southern Med. Jl.* 1924. Feb. Vol. 17. No. 2. pp. 106–108. [5 refs.]

These studies, based on typical cases, were made during an epidemic of dengue in the Gulf region of the United States in the summer of 1922. The blood of 16 cases was used for animal inoculation, 215 guineapigs being used for the initial transmissions; 87, representing 10 cases, reacted in a characteristic manner—pyrexia after three to five days, a secondary rise, and a concomitant leucocytic fall (the leucocytic count in guineapigs is very variable). No evidence of a causative organism was found by dark ground illumination or by culture. It is noted that the lymphatic tissue of infected guineapigs underwent a marked hyperplasia and that the recovered animals developed an immunity to many times the infective dose of the virus. The virus could be maintained in a virulent form in guineapigs through many passages.

P. W. Bassett-Smith.

JOURNAL OF THE ROYAL NAVAL MEDICAL SERVICE. 1923. Oct. Vol. 9. No. 4. pp. 285–297; 1924. Jan. Vol. 10. No. 1. pp. 24–34. **Naval Medical History of the War. Section of Tropical and Sub-Tropical Medicine. Part V.**

(i). **Dengue or Seven-Day Fever.** [BASSETT-SMITH (P. W.).] p. 285.

There were eight cases of dengue reported from Hong Kong in 1914, and 108, mostly contracted in Bombay, from the East Indies. In 1915 there were 313 cases, eighty of which were treated in Bermuda. The epidemic commenced in July and spread with great rapidity. In 1916 the total cases numbered 70 and in 1917, 122.

(ii). **Phlebotomus or Sand Fly Fever.** [BASSETT-SMITH (P. W.).] pp. 285–286.

Several extensive epidemics were noted in the Eastern Mediterranean. H.M. Hospital Ship *Rewa* accounted for 259 cases in 1916, and 221 were treated at Mudros Hospital in 1917.

(iii). **Phlebotomus Fever in the Eastern Mediterranean during the War, with Special Reference to its Prevention.** [MORRIS (Leslie M.).] pp. 286–289.

This fever caused a considerable amount of sickness in camps at Mudros, Suda Bay in Crete, and in Mitylene. It is described as a "foreshore disease." The typical sand-fly soil is ochreous and very friable. Camps situated on such soil were usually immune for the first summer, but suffered subsequently; in other words, breeding places for the sand-fly were artificially constructed in a favourable soil. The prophylaxis consists in avoidance of unsuitable localities. This was put to the test in 1918 in Mudros when the whole personnel of the R.N.A.S. camp was removed to a new site on hard ground, half a mile from the foreshore, and remained free from fever for the remainder of the summer. All huts should be well raised from the ground, thus allowing free ventilation, and the ground beneath should be sprayed with a mixture of crude oil and paraffin weekly. The most suitable deterrent ointment was Price's Solid Anti-Mosquito Preparation. The best treatment is to administer full doses of opium at the onset of fever and to continue 5-8 min. doses of tinct. opii combined with mag. sulph. t.d.s. Quinine is useless and only aggravates the symptoms.

(iv). **Phlebotomus Fever.** [LAMBERT (J.)]. pp. 289–297; 24–31. With 11 charts. [20 refs.]

This study made at Mudros supplements the paper of MORRIS reviewed above. 237 cases were noted, but this is short of the true total; only three occurred on the west side of the harbour. The population of these camps was very susceptible, being composed of young recruits or boys undergoing training. The men in ships in the harbour remained practically free from the disease. On close sultry nights sand-flies were most numerous. As the incubation period of the disease is two to four days and the period of development of the virus six to eight, the number of cases was usually greatest about 12 days after such a calm, whereas the admissions dropped considerably after a period of strong breezes. The incubation period appeared to be within six days; in one case under observation from the time of being first bitten it was only three. The symptoms are well described. The face and neck rapidly become congested; and sometimes circumoral pallor is noticeable. The highest temperature recorded was 105·6°F. The pulse rises at first but not in proportion to the temperature. The eyes rapidly become congested and the palate in 15 per cent. of cases. Rashes were not seen. Bradycardia is very common as the temperature drops during convalescence. Blood-counts showed a leucopenia of 4–5,000.

The pyrexia of phlebotomus fever may be classified under the following types :—

(*a*) Falling to normal by a direct line or curve.
(*b*) An indirect fall by lysis.
(*c*) A fall with definite recrudescence of temperature before reaching normal.
(*d*) A fall with recrudescence after the temperature has reached normal.

The synonym " three-day fever " is somewhat misleading, as the duration of the pyrexial period may vary from two to eight or nine days. This statement is borne out by a comparative table of a large number of cases from Malta and from India (Naushera).

The maximum temperature was reached on the first day in 21 per cent. of cases, on the second day in 63 per cent., on the third day in 14 per cent. and on the fourth day in 2 per cent. With temperatures higher than 102°F. there is a lagging of the rise of pulse-rate. The resemblance between the recrudescence of temperatures in this fever and in dengue is a very close one, but in no case was there any recurrence of pain or eruption of rash. About 11 per cent. of cases passed through two separate attacks of fever in the same season. It would probably be correct to say that in 90 per cent. of cases immunity is produced.

The usual eruption produced by the bite of phlebotomus is a papule, though, rarely, a small haemorrhagic spot marks the bite. The papules are usually carmine pink to dull red in colour. Urticarial forms of rash are not uncommon. In very susceptible persons a vesicular eruption is produced. The lesion produces a good deal of irritation and secondary staphylococcal infections may ensue.

(v). **Notes on Cases of Phlebotomus Fever at an Island in the Eastern Mediterranean.** [HIGGINS (J. T. D. S.).] pp. 31–34.

Consists of a detailed account of eight cases of phlebotomus fever of which six occurred in one house.

P. H. Manson-Bahr.

WHITTINGHAM (Harold E.) & ROOK (Alan F.). **The Prevention of Phlebotomus Fever.**—*Trans. Roy. Soc. Trop. Med. & Hyg.* 1923. Nov. 15. Vol. 17. No. 5. pp. 290–330. With 20 figs. & 10 charts. [6 refs.]

In this very interesting paper the results of a painstaking investigation carried out at Malta are fully set out. The authors remark that " a sound knowledge of the habits and habitat of the Phlebotomus is the keystone to successful prophylaxis," and they have advanced our knowledge very considerably on these points. The insects as shown are able to get into buildings through any minute opening, gather in sheltered corners and find cobwebs a considerable protection. Some individuals are very voracious feeders, drawing blood as many as 12 times. After 5 to 14 days the females escape outside and lay their eggs.

The chief prophylactic measures were (1) War on the insect in its various phases, with the abolition of breeding grounds and destruction of the adult flies. (2) Prevention of biting by removal of hiding places and use of nets, repellants, and air currents.

For the first, levelling the ground and making it impermeable, facing and pointing the walls were most important outside; swatting and spraying with 1 per cent. cresol most effective inside. Fumigation was of little use. For the second, destruction of the flies by personal efforts, thorough cleanliness of rooms, efficient ventilation, and removal of all refuse. Men are recommended not to wear slacks after sundown nor to bathe after dusk; to use sandfly-proof nets (45 meshes to the square inch) round beds, and repellants such as camphor in the beds. Great importance is attached to the use of natural air currents as far as possible and the liberal use of fans. At Calafranca by these means, in 1922, the incidence of sandfly fever was reduced by one half. There are a very large number of tables, charts, and diagrams, which render the report very complete and show the thoroughness of the investigation.

P. W. B-S.

DAS (Jahar Lal). **A Short Note on an Outbreak of Three-Day Fever in Patna.**—*Indian Med. Gaz.* 1924. Feb. Vol. 59. No. 2. pp. 86–87.

An epidemic of a short fever occurred during June 1923, in which the diagnosis between influenza, dengue, and phlebotomus fever was difficult. The majority of the cases were of a simple three day type; some lasted longer or had a secondary rise, but in no case was an exanthem noticed and respiratory symptoms were absent. A similar epidemic occurred in 1922, and on both occasions sand flies were abundant. [The Editor of *Indian Medical Gazette* states that the fever conforms with what he calls " sandfly dengue "].

P. W. B-S.

GARIN (Ch.). **Fièvre méditerranéenne à pappataci.**—*Rev. Prat. Malad. des Pays Chauds.* 1924. Jan. Year 2. Vol. 3. No. 5. pp. 349–358.

The author gives a very clear description of the short fever which was common in the Eastern Mediterranean during the war, variously described as Phlebotomus fever, Mediterranean dengue, etc., spread through the agency of *Phlebotomus papatasii.* He recognizes it as distinct from dengue, and from its clinical course believes it to be of spirochaetal origin. He, however, makes a mistake in stating that " dandy fever " and " breakbone fever " are English synonyms for it. He states that in the Macedonian epidemic of 1916 a rubeoloid exanthem was only found in 10 per cent. of the cases and appeared late in the disease, thus differing from that of dengue.

P. W. B-S.

MEGAW (J. W. D.). **The Typhus Group of Fevers.**—*Indian Med. Gaz.* 1924. Feb. Vol. 59. No. 2. pp. 68–79. With 2 figs. & 3 charts. [5 refs.]

This lengthy paper is a reiteration and development of the author's view on the " typhus-like " group of fevers (see this *Bulletin*, Vol. 9, p. 489; Vol. 19, p. 678), and in particular the series of cases that has occurred in the Kumaon hills. The " carrier " of this fever is in all probability a tick, possibly the *Rhipicephalus sanguineus* found by the author in the act of biting while he was at Bhim Tal. Two views of Bhim Tal and Sat Tal are given, showing the extremely wooded character of the neighbourhoods, and charts of the various types of " typhus-like " fevers emphasizing their similarity in course and duration; a table gives categorically the characters of louse-borne, tick-borne and mite-borne typhus on the one hand, and six endemic varieties in which the carrier is not as yet known for certain; this last group includes Kumaon, South African, Nigerian, Mossman, Adelaide and Deli types of typhus-like fevers [to which should be added the Alabama group (see below) in which the Weil-Felix reaction was present]. Much of the material of this paper is old, and there is a good deal of second-hand information, but it brings the present knowledge of this group of continued fevers with a definite exanthem well up to date and is very interesting.

[The possible implication of the *Rhipicephalus* tick as a carrier opens up a fresh field of research, to demonstrate the presence in it of spirochaetal or rickettsia bodies as etiological factors.]

P. W. B-S.

MAXCY (Kenneth F.) & HAVENS (Leon C.). **A Series of Cases giving a Positive Weil-Felix Reaction.**—*Amer. Jl. Trop. Med.* 1923. Nov. Vol. 3. No. 6. pp. 495–507. With 1 chart. [8 refs.]

In June 1922 a case of 14 day fever, with macular rash, occurred at Montgomery, Ala. The blood when tested gave a positive Weil-Felix reaction. The case was therefore diagnosed as typhus or Brill's disease, though there was no evidence of louse infestation or of endemic typhus. During the next *eight months, 12 other cases* very similar in character were investigated, in none of which could louse infestation be traced. The disease differed from typhus clinically in its mildness, polymorphous character of the eruption, fever ending in lysis rather than crisis, and the blood showing a leucopenia. In 11 of the 13 the Weil-Felix reaction was positive; the other two were only tested once early in the disease. Dengue, to which the disease bore a considerable clinical resemblance, was ruled out by the uniformly long duration of the fever, and the fact that in 13 cases of definite dengue tested at the time the Weil-Felix reaction was always negative [the first record of this reaction in this disease].

On clinical and serological grounds the diagnosis of Brill's disease or mild typhus seemed to be the most probable, but the mode of spread and distribution of the cases is difficult to explain.

[The series of cases has considerable resemblance to those described from Adelaide, Australia, and would be included in the " typhus-like fever " group with vector of doubtful origin for which further research is required.]

P. W. B-S.

KHALED (Z.). **Parenteric Fevers in Egypt.**—*Jl. of Hyg.* 1923. Aug. Vol. 21. No. 4. pp. 362–375. With 3 charts. [17 refs.]

From material gathered at the Hygiene Institute, Cairo, in 1922, the author carried out a most useful investigation on the etiology of the enteric-like fevers of the Egyptian area. This examination of more than 1,000 cases showed that of this number that were clinically typhoid only 11·7 per cent. proved to be enterica and that 10 per cent.

were due to *B. asiaticus* (112), leaving the astonishing number of 78 per cent. to other causes. These might be *B. pseudo-asiaticus*, *B. faecalis alcaligenes*, *B. carolinus*, Morgan No. 1 and others. Thus there is still a wide field for investigation which the author proposes to explore. This report, in particular, has very considerably advanced our knowledge of the epidemiology, aetiology and symptoms of the fever due to *B. asiaticus* Castellani. The author shows that all ages may be affected, that the disease is widely spread in the East, and that its seasonal occurrence is very like that of typhoid. Though the mortality is slight it is an important and distinctive disease, due to a definite microorganism easily cultured from the blood and stools and belonging serologically to the Paratyphoid Gaertner subgroup. A useful table of the fermentive actions of the Typhoid-Coli group is given, which shows that *B. asiaticus* ferments glucose and saccharose but not lactose and dulcite.

The importance of early blood cultures in all suspected enterica cases is emphasized; a positive finding, with the development after a time of a high degree of immune bodies in the blood, renders the diagnosis certain.

As the number of the different causative organisms increases the laboratory diagnosis of these enterica-like fevers is bound to become more laborious and protracted; nevertheless the advantage of such co-ordinated work as we have here between the clinician and the laboratory is absolutely necessary to unravel the aetiological tangle of these associated fevers.

P. W. B-S.

de Langen (C. D.) & Van Loon (F. H.). **The Dominating Symptoms of the Nervous System in Van der Scheer's or Five-Day Fever (Astheno-Neuralgic Fever).**—*Meded. Burgerlijk. Geneesk. Dienst in Nederl.-Indië.* 1923. Part 3. pp. 305-315.

The five-day or Van de Scheer's fever is the short non-classed fever with which the authors are most familiar, and they discuss it chiefly from a neurological point of view. They appear to look upon the pains and many of the symptoms as evidences of a neuritis, and not a myositis, associated with asthenia. They give some reasons for believing that there is a retardation of the currents along the nerves [as has also been described in beriberi]. They state that the nerve symptoms are so striking and frequent as to give great assistance in diagnosis, and draw attention to a disease found in Cochin China described as "asthenomyalgic fever" by Noel Bernard which is thought to depend etiologically upon the *Bacillus asthenogenes*. This fever is probably similar to the five-day fever and they suggest that the name "astheno-neuralgic fever" would be more appropriate for both.

P. W. B-S.

Bradley (Burton). **The Diagnosis of Dengue Fever.** [Correspondence.]—*Med. Jl. Australia.* 1923. Mar. 24. 10th Year. Vol. 1. No. 12. p. 335.

Fourcade (A.). & Le Bourdellès (B.). **Deux cas d'infections paratyphiques à bacilles d'un type aberrant.**—*Arch. Inst. Pasteur d'Algérie.* 1923. Vol. 1. No. 1. pp. 4–7. [4 refs.]

Hehir (Patrick). **Typhus Fever in Greek Refugees.**—*Ann. Trop. Med. & Parasit.* 1923. Oct. 13. Vol. 17. No. 3. pp. 347–358. [2 refs.]

Thurston (E. Paget). **The Differential Diagnosis of Dengue Fever and Influenza.** —*Med. Jl. Australia.* 1923. Mar. 3. 10th Year. Vol. 1. No. 9. p. 227.

ROCKY MOUNTAIN FEVER.

WOLBACH (S. Burt) & SCHLESINGER (Monroe J.). **The Cultivation of the Micro-Organisms of Rocky Mountain Spotted Fever** (*Dermacentroxenus rickettsi*) **and of Typhus** (*Rickettsia prowazeki*) **in Tissue Plasma Cultures.**—*Jl. Med. Res.* 1923. Dec. Vol. 44. No. 2. (Whole number 191). pp. 231–256. With 1 plate and 1 text fig. [6 refs.]

It is impossible to do more than outline this interesting and detailed description of the process of cultivation of the minute micro-organisms known as *Dermacentroxenus rickettsi* and *Rickettsia prowazeki*; it should be read in extenso. The culture media used were guineapig testis in specially prepared guineapig plasma for Rocky Mountain fever, and brain substance in plasma for typhus. The authors were able to carry out many subcultures showing the organisms already often described. Under the conditions of the experiments both micro-organisms survive only within the cells, and are capable of multiplying only within those cells that are of endothelial origin. They do not multiply or persist in the plasma, and the infected cells die, but it is not clear by what mechanism the organisms pass from cell to cell.

There is a good plate showing the infecting organisms in infected cells.

P. W. Bassett-Smith.

SPENCER (R. R.) & PARKER (R. R.). **Rocky Mountain Spotted Fever: Viability of the Virus in Animal Tissues.**—*Public Health Rep.* 1924. Jan. 11. Vol. 39. No. 2. pp. 55–57. [3 refs.]

The authors were able to preserve the virus of Rocky Mountain fever, without loss of virulence, in glycerine kept at – 10°C. for more than 10 months. The best tissue for the purpose was the testicle of infected guineapigs, and this tissue-virus could be dried in vacuo, remaining effective for two months at – 10°C.

P. W. B-S.

HAYASHI (N.) & TAKEUCHI (N.). **An Etiological Study on Rocky Mountain Spotted Fever.**—*Aichi Jl. Experiment. Med.* Nagoya. 1923. Mar. 31. No. 1. pp. 69–74. With 5 plates. [9 refs.]

The authors have minutely studied material from a case of Rocky Mountain fever and animals inoculated from it, and they draw attention to the similarity of the symptoms, eruption, and mode of transmission of this disease, tsutsugamushi disease, and typhus. Three kinds of organisms were found in their material, namely (1) long spirochaetal forms, (2) bent rods, and (3) coccoid, diplococcoid, and double lanceolate forms very similar to those described by RICKETTS and WOLBACH in this disease and to *Rickettsia prowazeki* of typhus. The authors consider that all three forms are stages of a single organism and that they are the cause of Rocky Mountain fever. Since monkeys immunized to tsutsugamushi disease were not protected from fever when inoculated with these bodies, they conclude that the two diseases are distinguished one from another by their immunity reactions. Five good plates illustrate the paper.

P. W. B-S.

JAPANESE RIVER FEVER.

FAUST (Ernest Carroll). **The Possible Incidence of River Fever (Tsutsugamushi Disease) in the Central Yangtze Valley.**—*China Med. Jl.* 1923. Dec. Vol. 37. No. 12. pp. 979–987. With 16 figs. [7 refs.]

Two cases from Wuhan of primary *Schistosoma japonicum* infection showed in smears from the blood and spleen minute rod and spheroidal bodies, the cytoplasm of which stained azur and the nuclear elements brick red with Giemsa. There was also marked anaemia, leucopenia, and diminished coagulability of the blood. The bodies were found in the red cells, in the lymphocytes, and free in the plasma. Their presence together with certain clinical symptoms suggested a diagnosis of tsutsugamushi disease, and more careful study of cases of splenomegaly of obscure origin in the Yangtze valley is necessary, particularly as according to KITASHIMA and MIYAJIMA (1918) this disease was known in ancient times in China. The photographs of the blood and drawings given of this organism under the name of *Theileria tsutsugamushi* are not good.

P. W. Bassett-Smith.

SELLARDS (Andrew Watson). **The Cultivation of a Rickettsia-like Micro-Organism from Tsutsugamushi Disease.**—*Amer. Jl. Trop. Med.* 1923. Nov. Vol. 3. No. 6. pp. 529–546. With 1 plate. [11 refs.]

After giving a general summary of the clinical characters and the experimental work of KITASHIMA and MIYAJIMA in Japan,* the author describes his own investigations made in Japan in 1922. Haemorrhages were found after inoculation in guineapigs and monkeys, analogous to these found in man, mostly in the lymph glands, and as petechiae in the skin. Cultures of Rickettsia-like bodies were grown anaerobically at 37°C. and were subcultured without much difficulty, though growth was feeble except with the use of Martin's agarchocolate media. Inoculations from these produced similar lesions to those seen when using the ordinary virus. The pleomorphism of the organism, well shown in a plate, was similar to that previously described, but our knowledge is at present insufficient to classify definitely, but the organisms appear to differ from ordinary bacteria and require a grouping of their own, the term Rickettsia being retained. Clinically the author includes trench fever in the group, with Rocky Mountain spotted fever, typhus and tsutsugamushi disease and suggests that for the latter type of organism the name *Rickettsia nipponica* should be used.

P. W. B-S.

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* See this *Bulletin*, Vol. 13, p. 342, but the second part of this important paper embodying the experimental work escaped notice.

MISCELLANEOUS.

CALCUTTA. **Annual Report of the Calcutta School of Tropical Medicine, Institute of Hygiene and the Carmichael Hospital for Tropical Diseases for the Year 1923.** [MEGAW (J. W. D.), Director and Professor of Tropical Medicine.] 86 pp. With 16 figs. [Date and place of publication not stated.]

It is evident from this most interesting document that the Calcutta School of Tropical Medicine is now settled and harmoniously compacted and is working full-time both on its educational side and in many fields of original research. It is also giving play to a sound proselytizing instinct—destined, if encouraged, to raise the whole tone and level of medical education in India—in its endeavour to attract officially-accredited students from other provincial governments, in the hope that these students after their training may form centres of instruction in their own native Provinces. This is the true spirit—far above meretricious propaganda.

The School provides annually three courses of instruction, namely, a six months' course for its own D.T.M.; a three months' course in the accurate diagnosis and modern treatment of tropical diseases, for men who have no need or desire for a special diploma; and a course for the D.P.H. of the Calcutta University and other academic corporations, the instruction in bacteriology, protozoology, entomology, and helminthology being the same for this last course as for the D.T.M.

The facilities for instruction, as also for original work, are ideal, since the Carmichael Tropical Diseases Hospital, with its 100 beds and its large and already popular out-patient department, is in intimate propinquity to the School and is directed and administered by the School staff. During the year in review the number of in-patients here under observation and treatment for kala azar was 220, and for malaria, dysentery, and filariasis 247, besides 330 for other diseases; while the number of out-patients treated for kala azar was 1,251; for malaria, etc., 1,390; for leprosy, 245, and for other diseases 2,527.

For the treatment of leprosy a separate institution in affiliation with the School was approved, but owing to the dolorous opposition of residents in the locality (many of whom—such is " that strange prodigious creature man "—appear to be incipient lepers themselves) the design had to be abandoned. For the treatment of rabies a special Pasteur Institute, on the same footing as the hospital, is proposed and is likely to be realized.

A particular feature of the School is the " cool room " necessary for certain operations of the laboratory and always comfortable for work. Air, after being passed over the pipes of a refrigerating plant, is drawn into a room insulated by cork, the heated air being concurrently exhausted; and the apertures for ventilation are filled with cotton-wool to filter germs and dust. The room has been a success, notwithstanding forebodings, and its promising applications are unbounded.

In the field of original work the ideals of the School are deliberately restricted to the advancement of knowledge of the causation, diagnosis, treatment, and prevention of the momentous diseases of India, research of a purely " academic " kind being distinctly excluded. The limits are not narrow and the motive, being humanitarian rather than grossly utilitarian, is good; yet one cannot but think that it too much forgets the historic lesson that great advances in science have usually been made by men who took little or no thought for the practical applications of the morrow, by men who, as HUXLEY said, "sometimes intentionally, much more often unintentionally, light upon something which proves to be of practical value." One cannot but think that a pure biologist with a particular affection for mycology and a vestal bio-chemist of purest ray serene might light upon something of practical value for tropical medicine. But in medicine we need not quarrel with ideals too intent on practical ends, and the Director of the School, at any rate, is profoundly imbued with the policy of giving every worker perfect intellectual freedom and the greatest latitude within the set limits, and he expresses small faith in catch-words and industrial metaphors, or for the mechanical efficiency of the drill-hall, in the affairs of the laboratory.

Owing to the numerical strength of the staff the individual teacher, as a rule, need not devote more than one day of each week to the actual teaching of the class, and this gives him plenty of opportunity for clinical study in the hospital as well as for original work. The outcome is to a considerable extent evident in 35 papers, covering a wide range of interest, two-thirds of which were published during the year in the *Indian Medical Gazette*. Most of these have been noticed in this Bulletin, so that all that is now necessary is to review, in the order presented, some of the noteworthy doings of the laboratories from which they issued.

Kala azar.—Experimental transmission to animals has not led to much; of 77 animals injected only 7 became infected, and 3 of these only transiently, and of 17 that received infective feeds only 1 took. A survey of Calcutta has revealed cases from most wards of the city outside the European areas. In the out-patient department 1,251 cases were treated, mostly with antimony tartrate. Eighty per cent. of in-patients discharged as cured were followed up and 5 of them were found to have relapsed. Results of treatment with Bayer 205 were very disappointing. Van Heyden 471 (metachlorparacetylaminophenyl stibiate) gave some strikingly good results, and van Heyden 661, though not so good as 471, has proved better than antimony tartrate. Urea stibamine did not give constantly good results. Experiments are being carried out with oral administration of antimony tartrate.

Hookworm.—A critical investigation of carbon tetrachloride confirmed the proposition that it is the most efficient drug known for hookworm (also that it is effective for threadworms, but of little or no use for other roundworms or for tapeworms). Though it is not detoxified if the liver be seriously damaged or disturbed, it does not in medicinal doses cause degeneration of the normal liver. If sprayed upon the mucous membrane of the trachea (as it might be if forced upon struggling children or if taken by patients liable to cough) it causes reflex stoppage of the heart. The previous year's experiments, showing that hookworm larvae in Bengal cannot live in ground exposed to sun during the hot season, were confirmed; on the other hand, ovulation appears to be greatest during the rainy season.

Cholera.—Two small epidemics in non-endemic areas were actually traced to their origination from Hindu pilgrims.

Leprosy.—The comparative efficacy of various oils has been tested; esters of linseed oil though superior to esters of coconut oil are not equal to esters of hydnocarpus. Injections of thymol dissolved in olive oil have shown promise, and without renal irritation. Solutions of trichloracetic acid applied to leprous lesions have done very great benefit. Small doses of potassium iodide have stimulated reaction to small injections of esters. Simultaneously-combined treatments are recommended for cases intractable to one form of treatment. Attention to the general condition and hygienic environment is of great importance in all forms of specific treatment. Observations carried on in the out-patient department of skin diseases has led to the conclusion that fully 15 per cent. of the cases coming for diagnosis are leprosy, early cases of this disease not being generally recognized but being attributed by general practitioners to psoriasis, eczema, etc.

Filariasis.—A general survey has shown this disease to be widely prevalent in Bengal. The view that elephantiasis is a disease associated with long residence in badly infected areas is confirmed.

Tropical Medicine.—From this Department has emanated a series of papers (already noticed in this *Bulletin*) distinguished equally for comprehensive analysis and judicious synthesis, on epidemic dropsy and beriberi; on the typhus group of fevers; on the cognate relations of dengue, sandfly fever and other seasonal fevers of short duration; and on dysenteric ascites. The survey of the distribution of the most important diseases of India has been continued also.

Skin disease.—To the surprising statement as to the frequency of leprosy in its most infective stage being overlooked as a mere eczematous eruption is added other evidence of the appalling ignorance of skin disease among general practitioners. An interesting group of cases of intense scleroderma of palms and soles supposed to be due to thyroid deficiency has yielded to dried extract of thyroid gland in large doses. Interesting cases of acute psoriasis giving a moderately positive WR are mentioned where the administration of a large dose of salvarsan has been followed by a general acute exfoliative dermatitis.

Protozoology.—The catholic spirit that animates the whole School is nowhere better illustrated than in the work of this Department. In addition to a considerable educational output of pure protozoology its tale includes a series of critical experimental investigations on the transmission of kala azar and yaws, on the treatment of malaria and amoebic dysentery, on the delusive nature of certain "leptospirae," and on the causation of the pernicious anaemia of pregnancy.

Pharmacology.—Some of the most interesting and suggestive work of this Department has been carried out in co-operation with the Department of pathology and bacteriology—work which may be called philosophical, without any disparagement of its experimental method and of its fundamentally practical bearing, on the influence of the substrate upon the action of drugs; for, as is most justly stated, it is useless to study bacterial toxins and other complex proteid poisons without knowing how the simpler inorganic bases act in the body. Much attention has also been given to clinical and chemical study of indigenous drugs—among them *Vitex peduncularis*, certain species of *berberry*, and *Peganum harmala*, the reputed value of which in the treatment of malaria was not confirmed. [It is to be hoped that in the trial of substitutes for quinine *Teucrium leucocladum*, a common herb of the North-Western frontier, may be included.]

Medical Entomology.—Besides educational routine, field observations of malarious tracts have been carried out and laboratory observations of various arthropods in their pathogenetic relations.

A. Alcock.

CHRISTOPHERS (S. R.). **What Disease costs India : Being a Statement of the Problem before Medical Research in India.**—*Indian Med. Gaz.* 1924. Apr. Vol. 59. No. 4. pp. 196–200.

The author of this thoughtful paper does not adopt the fashionable device of estimating in problematical sums of money the amount of India's loss by preventable disease. Far better ; he produces from the latest census returns certain recorded facts of a high general death rate, of a heavy mortality from specified epidemics, and of an actual decrease of population, certain comparative forecasts of expectation of life, and certain reasonable estimates of a wide-spread physical infirmity from specific diseases ; and from these he draws inferences, impressive because they can be followed and realized, of a loss of vital energy which must have enormous economic and financial and even political repercussions for India.

As regards death rates : in 1921 the total death rate for the whole of India was 30 per mille, ranging from 20 in Upper Burma and Madras (where, probably, registration is deficient) to 44 in the Central Provinces ; in Great Britain in 1911–1915 it was 13·8 per mille. As regards expectation of life : the expectation during the first year of life is given in India as about 23 years, compared with about 44 years in Great Britain ; at the age of five in India about 35 years, compared with about 54 years at the age of three in Great Britain ; at the age of twenty in India about 27 years, compared with about 41 years in Great Britain ; at the age of fifty in India about 14 years, compared with about 19 years in Great Britain. A high death rate may actually diminish the population : whereas in the decade 1901–11 the total population of India showed an increase of 6·4 per cent., in the decade 1911–21 it was only 1·2 per cent.—a difference not attributable to emigration or to a diminished birth rate ; in the United Provinces (population 49 millions) the population decreased by 1·1 per cent. in 1901–11, and by 3·5 per cent. in 1911–21 ; and in a large area of the Punjab a population of 13 millions had decreased (1911–21) by 9·7 per cent.

Probably the principal cause of this increased death rate, or decreased expectation of life, is the persistence in India of great epidemics of diseases that have practically disappeared from Western Europe—*e.g.*, malaria, cholera, plague, relapsing fever. Undoubtedly much fever of other kinds has been confounded with malaria ; but as an example of the effects of a great epidemic of the kind meant, the outbreak of malaria in the Punjab, in 1908, is given, when in a population of about 20 millions inhabiting an area of 5,000 to 6,000 square miles about 250,000 deaths from this disease occurred in the course of three months.

Besides mortality there has to be considered the general infirmity and physical incapacity entailed by epidemic diseases and by the widely endemic diseases of India—anaemia, ancylostomiasis, dysentery, eye-diseases, filariasis, leprosy, parasitic skin diseases, tuberculosis, and by deficiency diseases. All this, though it cannot be expressed in terms of money, represents a loss of economic energy. It is an obstruction to the main business of agriculture, retards industrial expansion, procrastinates trade and administration, and gives the country an expensive sanitary ill-repute.

How can this enormous waste of energy through premature death and preventable sickness be stemmed ? Not by Government, however humane and anxious, unless fully and accurately informed upon the causation and treatment and prevention of disease; and this information can be obtained only by research.

On the subject of medical research the experienced author expresses some opinions that deserve respect. Research cannot be purchased in the laboratories of Europe; it must be conducted on the spot—in India. Research is not like an expedition that needs a single control to bring it to a successful end within a time-limit; it must go on and on, gathering volume, and, if the right spirit be there, overlapping can do no harm.

A. A.

HUCK (John G.). **Sickle Cell Anaemia.**—*Bull. Johns Hopkins Hosp.* 1923. Oct. Vol. 34. No. 392. pp. 335–344. With 5 plates & 2 charts. [7 refs.]

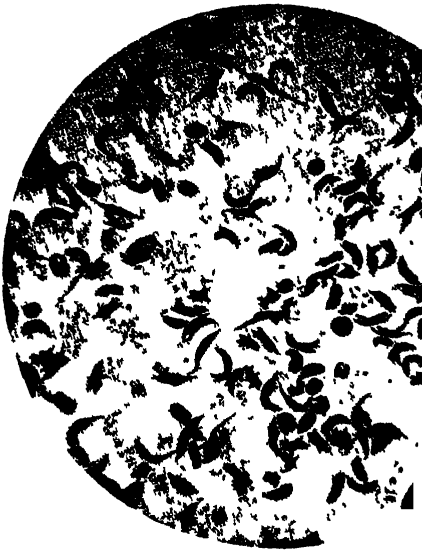
This is an unusually finished study of the interesting form of anaemia that takes its name from the peculiar sickle or crescent shapes assumed by the red corpuscles *in vitro.* Hitherto this disease has been thought rare, only 4 cases having been recorded (see this *Bulletin,* Vol. 7, p. 329, and Vol. 20, p. 670); we now learn that it is fairly common, though, up to present observation, only in the negro race.

The fruitful investigations under review are founded on material afforded by 20 cases, of which 2 are fully reported and 12 briefly abstracted. They include two family-trees, each extending to three generations, from which it appears that the peculiar property of the red blood corpuscles is, like haemophilia, a Mendelian inheritance, but, unlike haemophilia, not limited to one sex. In the light of this interesting discovery the author very justly dismisses the conjecture that the disease is any manifestation of syphilis or of tubercle.

Symptoms of the disease may be absent, mild, or severe. The first two classes of cases are not likely to come to notice, because as the symptoms are merely weakness and lassitude they soon pass away after a little rest in bed. In the severe cases, besides weakness, lassitude and all the usual accompaniments of anaemia, there are stiffness and pains in muscles, simulating "rheumatism"; often a sharp pain in the epigastrium, particularly after eating; and ulcers on the legs, which may have been produced by any slight injury; fever usually exists, but rarely goes above 101° F. with morning remissions, and night sweats sometimes occur; the course of the illness consists of a series of remissions and relapses.

The physical examination shows greenish-yellow sclerae, pale mucosae and often slight oedema of ankles; slight general gland enlargement; liver palpable but not the spleen; heart usually slightly enlarged to the left, a soft generalized systolic murmur, and the second pulmonary sound accented, pulse rapid and variable, blood-pressure low; genitalia infantile; an ulcer (or scars) on legs or feet. The urine is of low specific gravity (1010–1012), and albumin from a trace to 2 *plus,* and a few granular casts may be found. Stools, WR, blood-culture, chemical examination of blood, transmission experiments, all negative.

The blood phenomena are given in detail, along with particulars of controlled experiments and individual charts. The blood clots normally. The red corpuscles number from 1,500,000 to 4,000,000; haemoglobin 30 to 63 per cent. An occasional sickle-shaped cell may be seen in fresh drawn blood, but the picture seen in the accompanying illustration was made from a sealed film 48 hours old. Stained films show—more abundantly in relapses—the characteristic sickles or oat-shaped forms. Haematoblasts of all varieties—but mostly normoblasts—may be found. The leucocytes are increased to 10 up to 20 thousand, but the differential formula shows nothing characteristic. The polynuclears (usually neutrophile) are generally increased, or the small lymphocytes may be. Neutrophile myelocytes (from 1 to 3, occasionally up to 7 per cent.) form the majority of abnormal white cells, but are not at all constantly found. Platelets are increased—300,000 to 500,000. In fresh preparations large endothelial mononuclears may be seen engulfing red corpuscles. Experiments showed that the sickling of the red corpuscles is due to something inherent in themselves and not to any property of the serum.



Sickle Cells. Fresh blood preparation after 48 hours.

[Reproduced by permission from *Bulletin of the Johns Hopkins Hospital* 1923 Oct.]

The pathological appearances and histology of the leg ulcers is fully described. They have the round punched, indurated appearance of syphilitic ulcers.

Prognosis is unfavourable only in severe forms of the disease on account of the susceptibility to intercurrent infections, especially pneumonia and tonsilitis.

A. A.

JAMISON (S. Chaillé). **Sickle Cell Anaemia (Report of a Case).**—*New Orleans Med. & Surg. Jl.* 1924. Feb. Vol. 76. No. 8. pp. 378–379.

The patient in this case was a coloured girl of 11 years, with a history of healthy babyhood, a long and severe attack of "yellow jaundice" between her first and second year, and brief and mild storms of jaundice and vomiting nearly every month of her life afterwards, and life-long fever and "dumb chills." When examined she was under-developed, but fairly well nourished, the buccal mucosa was pale, the tonsils enlarged and exuding pus, the lymphatic glands everywhere moderately enlarged, and the liver and spleen palpable. During four months' stay in hospital the temperature ranged from normal to 101° F., the haemoglobin ranged from 30 to 35 per cent., and the most remarkable feature of the blood-picture was the shape of the red corpuscles: "five or six of the corpuscles seen in every field of the oil immersion were crescentic, sickle-shaped, or long and narrow and pointed at both ends." Unfortunately, the patient was removed from hospital. The author thinks the case must have been inherited syphilis.

A. A.

CALMETTE (A.). **Sur l'utilisation des singes en médecine expérimentale. Le Laboratoire Pasteur de Kindia (Guinée Française).**—*Bull. Soc. Path. Exot.* 1924. Jan. 9. Vol. 17. No. 1. pp. 10–19. With 1 fig.

There are many diseases—those instanced in this almost profanely fascinating paper are measles, scarlatina, typhus, yellow-fever, influenza, trachoma, yaws, goundou, leishmaniasis, and human trypanosomiasis – that are not transmissible to the inferior creation utilized in the routine of the laboratory, and the rational study of which must therefore be abandoned altogether unless we can command the assistance of our nearer relatives, the apes and monkeys. But as large numbers and a constant supply will be required, apes and monkeys must be recruited, nurtured, and hygienically regimented in the colonies. We learn here that the Pasteur Institute has already made a beginning in this business. In the island of Los, near Konakri in French Guinea, the Institute has secured a large, well-watered, woody and fertile tract of land near a forest inhabited by chimpanzees and several species of monkeys, and is constructing there residences and shady parks for these animals, and accommodation for the native Africans who are to attend upon them, for the scientific men and apparatus competent to utilize them for study, and for the Director of the whole community; nor among other things are infirmaries for the sick Primates forgotten. Chimpanzees are the most desirable animals. When captured young and treated well they are like children. Besides being the most suitable of our relatives for pathological study, they may be educated and so may furnish material for experimental psychology. When the young males grow up and perhaps become intractable they at least have glands that can be used for the rejuvenation of old men. Three species of baboons are also mentioned: they are all ferocious, clamorous, brazen-faced, rude, unmanageable animals, "but they are very intelligent." Three species of Cercopithecus also live well in captivity. All things relating to the raising, treatment and maintenance of health of monkeys are discussed and explained in this paper. In dealing with experimentation it is pointed out that the normal temperature varies according to species, so that the individual temperature of each subject destined for experiment should be determined beforehand. Age is also a factor of importance in experimentation; sometimes (as with typhus) young monkeys are much less susceptible than adults.

Doubtless "monkeys represent for microbiologists experimental material of incomparable opulence and pliability."

A. A.

LEVADITI (C.) & NICOLAU (S.). **Le mécanisme d'action des dérivés bismuthiques dans les trypanosomiases et les spirilloses.**—*Ann. Inst. Pasteur.* 1924. Mar. Vol. 38. No. 3. pp. 179–239. With 13 text figs. [18 refs.]

The conception of the therapeutic effect of a given drug being dependent upon modifications undergone by that drug within the organism is familiar, and has led these authors to conceive of obtaining that therapeutic effect *in vitro* by subjecting the drug to the action of fresh animal tissues at body-temperature. In this fascinating paper, where the results of seventy varied experiments are severally summarized and tabulated, they show how the bi-compounds of bismuth, which, as such, have not, in moderate concentrations, any destructive effect upon trypanosomes and spirilla *in vitro*, become deadly to those organisms *in vitro* after they have been acted upon by fragments or extracts of fresh animal tissue (liver, lung, brain, suprarenals, ovary, spleen, thymus, muscle) at body temperature. Hepatized bismuth, for instance, destroys trypanosomes in a dose of 0·05 cc. and spirilla in a dose of 0·05 cc., while cerebrized bismuth destroys trypanosomes in a dose of 0·005 cc. This conversion, or activation, of bi-compounds of bismuth cannot be brought about in this way, however, by whole blood, washed erythrocytes, serum, egg-albumin, yolk, yeast, or nucleinic acid. As it can be effected only by fresh tissues and tissue-extracts, the authors, in strange materialistic fashion, postulate a " bismogene " or " substance transformatrice " in the tissues, by which the inert bismuth is converted into the active *Bismoxyl.* The properties of " bismogene," and the ways of preparation and the nature and properties and therapeutic action of Bismoxyl are described at length in a paper which itself is a long and lucid summary that can be mutilated but not abridged.

A. A.

THOMPSON (Joseph C.). **" Tropical Neurasthenia " : A Deprivation Psychoneurosis.**—*Milit. Surgeon.* 1924. Mar. Vol. 54. No. 3. pp. 319–327.

This paper deals with " Guamitis " or tropical asthenia as illustrated among white men stationed in Guam, one of the islands of the Marianne or Ladrones group. The author endeavours to analyse the possible factors of a " pyschic atmosphere that beggars description." As potential factors climate, food, cost of living, influence of Governor, must be eliminated : the climate of Guam is on a par with the vaunted health-resorts of Europe, the food may not be that of the highest realms of gastronomy, but it is good and varied, and in some particulars luscious, and one can live there better and more economically than in any city of the U.S.A., and finally the thing goes on irrespective of the individual personality of a series of governors. So the author has to fall back on ennui—the ennui of the Caucasian deprived of all the excitements of " civilisation," who unable to fly from his land of exile makes all sorts of extraordinary flights from himself [oblivious of the Horatian admonition " Patriae quis exsul sequoque fugit "].

A. A.

GREENWOOD, with a Chapter by ARKWRIGHT (J. A.). **The Life and Scientific Work of Arthur William Bacot.**—*Jl. of Hyg.* 1924. Mar. Vol. 22. No. 3. pp. 265–304. With 1 plate. [106 refs.]

An untrained man who can work for his daily bread in a City counting-house from boyhood to the age of 43, and then can take his place in the world as a master of experimental biology must be a genius. Such a man, a born naturalist of true Darwinian fibre—though not, of course, of that Olympian stature and plenitude—is here made known to us in BACOT.

While toiling for 27 years in the City, BACOT occupied himself at home with living things, intent on Lepidoptera, their life history, genetics, and general bionomy, and acquiring an exquisite, almost prophetic, skill in dealing with live insects. At the age of 45 the Fates took him from the counting-house, set him in the Lister Institute, and ordained and beneficed him there as entomologist in the service of Hygiea. To the ordinary man it is detriment to have his hobby turned into his livelihood; the fond exacting mistress of desire is too like to become the *placens uxor* of easy obeisance; but BACOT was not in the roll of common men. In the free atmosphere of the Lister Institute he set himself at once to study rat-fleas in their bearings on the epidemiology of plague, and in giving precision to the whole history of these insects he revealed the suggestive fact of their protracted survival under adverse circumstances in a resting-larva-cocoon stage, and (in union with C. J. MARTIN) discovered the phenomena of plague-infection by the bite of the infected choked flea. In 1914 he was deputed to West Africa with the Yellow Fever Commission, and in the course of his experiments there discovered the favourable influence of befouled water on the hatching of the eggs of *Stegomyia fasciata.* During the war he worked unremittingly upon lice—their life-history and control, and their exact relations with Rickettsia bodies in trench fever; and he had these delicate insects so schooled and regimented that for all experimental purposes he could produce them according to age-specification like market stuff. He also experimented with the bed-bug in relation to typhus fever, and incidentally discovered the Rickettsia bodies normally inherent in all stages of that insect. In 1920 he joined as entomologist the U.S. Red Cross expedition to Poland for the study of typhus, and added to his experience by getting trench fever, and in pleasanter ways. On his return to England he continued his study of Rickettsia bodies in lice and in the sheep-ked; among other things he was unable by experiment to corroborate the suggestion that the typhus virus is identical with the O form of *Bacillus proteus* X 19. In November 1921 he joined a party to investigate typhus in Egypt, and there early in the following year, in handling infected lice and their excreta, he must have infected himself with that disease. He became ill, at Cairo, on the 26th March, but would not stop work at once, and on the 12th April he died, mourned even by those who knew him only by his work. A. A.

WOODCOCK (H. M.). **On the Modes of Production of "Rickettsia"-Bodies in the Louse.**—*Jl. Roy. Army Med. Corps.* 1924. Feb. & Mar. Vol. 42. Nos. 2 & 3. pp. 121–131; 175–186. With 23 text figs. [16 refs.]

The author's interesting speculations on haematophagy, or abnormal digestion of red corpuscles by fixed tissue-cells deranged by a pathological ferment (*Bulletin,* Vol. 19, p. 620), and his theory of the origin of Rickettsia bodies sometimes from the disintegration of nuclear material, sometimes from haematophagy or haematoboly (Vol. 20, p. 677) are here carried a stage further, though they do not bring us any nearer to the unknown something that rouses a dormant "autolytic" ferment to a furious pathological outburst. The present paper, though it contains some evidence (from smears) that the epithelial cells of the gut may digest red corpuscles (normal haematoboly) in the ordinary healthy louse, is chiefly occupied with evidence that bodies indistinguishable from Rickettsia in size and form and colour and also in their constant clumping are produced in lice as a normal process, chiefly in the lumen of the gut and mainly by the destruction of the haemoglobin of the food, but perhaps also by the disintegration of the nuclei of desquamated cells from the wall of the gut. The author describes all gradations between granules and forms that resemble Rickettsia in everything but colour and persistence of iron and typical lilac-red Rickettsia not giving the iron reaction, and handles his argument with convincing skill. But although he concludes that Rickettsia bodies are formed in healthy lice as a normal process the author does not dispute an interdependence of some sort between Rickettsia and certain specified diseases. His argument is that in the healthy (normal) louse, where the haemoglobin is dealt with almost exclusively in the lumen of the gut (extracellular) the Rickettsia bodies originate from pigmented detritus that has lost its iron, and not from the quite subordinate process of haematophagy (intracellular digestion); and that it is only under the influence of a pathogenetic ferment that this latter process becomes overwhelmingly magnified. Under this influence the mild subordinate intracellular process becomes an overpowering haematoboly, leading to the death of the cells and the disintegration of their nuclei with the extensive formation of Rickettsia bodies from the nuclear detritus.

A. A.

PIJPER (Adrianus). **Bronchomoniliasis and Monilia-Fungi in Sputum.**—*Med. Jl. S. Africa.* 1923. Nov. Vol. 19. No. 4. pp. 101–111. With 5 figs. [30 refs.]

In 67 consecutive examinations of the sputum of suspected cases of pulmonary tuberculosis in South Africa, fungi of the genus *Monilia* (Gmelin non Persoon) were found in 36 cases. Seven of these could not easily have escaped detection, owing to the large number of fungal elements present. Nine more revealed the presence of irregularly scattered budding cells in many fields from direct smears. The Unna-Pappenheim method for staining the bacillus Ducrey (KOLLE & WASSERMANN. Handb. Pathogen. Mikroorgan., V, p. 1227) proved an excellent differential stain for the fungi, while cultures permitting of their identification as Monilia were readily obtained on an acid medium consisting of ordinary broth made up to PH 2 by 1/10 n. hydrochloric acid. In 20 other cases it was difficult to find microscopic evidence of the presence of fungi, but they were isolated in pure culture on the medium referred to. Their free growth in such a medium is correlated with the reported frequency of these fungi in ulcer of the stomach, where the gastric juice becomes exceedingly acid and would readily allow of growth of Monilias reaching the stomach from the throat. In three only of the whole series were tubercle bacilli found. Though Monilias occur at times in milk and in human faeces, attempts to establish their presence in the air of the laboratory failed. All the cultures examined grow better at blood heat than at room temperature and this fact is regarded as telling in favour of their pathogenicity.

Several of the patients showed persistent cough, much sputum, emaciation, loss of appetite, loss of energy, sweating, and an occasional haemorrhage from the lung. The rest had usually little more than a chronic cough and troublesome sputum. In ordinary clinical practice the author contends that only the relatively few cases that showed plentiful fungal elements in the sputum would be classed as bronchomoniliasis, yet the fungi in these cases were not different from those found only by special methods. More than 50 per cent. of these cases of chronic cough and other symptoms, such as led to the suspicion of tuberculosis, were associated with the presence of Monilia. The author claims therefore that either bronchomoniliasis does not exist, or the majority of chronic affections of the respiratory organs must be called bronchomoniliasis.

Inoculation into rabbits gave positive results in most cases, direct intra-tracheal inoculation causing the formation of lung nodules in 16 out of 43 cases (some from milk giving positive results) while emaciation was caused by small doses in 22 out of 43 isolations inoculated intravenously. In all cases it proved possible to kill the rabbit by a sufficiently large intravenous inoculation which, if not too large, caused death by septicaemia within a week. The reputation of potassium iodide in chronic respiratory trouble is suggested to be due to the known effect of iodine in cases of fungal infection. Nevertheless, pathogenicity to rabbits was found to have no relation to the origin or varietal characters of the fungi, and it was impossible to predict the virulence to rabbits of any strain. Bronchomoniliasis is not a clinical entity: the diagnosis cannot be made at the bedside. The author doubts whether it can even be called a pathological entity, since Monilia is present in so many sputa, many of which contain other organisms also, and it is not possible to correlate abundance of fungal elements with severity of symptoms nor either with pathogenicity to rabbits.

The biochemical reactions of 43 isolations of Monilia (including the 36 referred to above) are given. Three serological groups were differentiated by complement fixation tests. Biochemically the strains fell in part into some of the ten groups recognised by CASTELLANI from their fermentative activities, but eleven isolations did not agree with any of these groups. Culturally the most important character was the appearance of gelatine stab cultures, which served to differentiate two main groups, one having the appearance of an inverted fir tree and the other resembling an ostrich feather. Little is said regarding the morphology of the fungi, except that eleven had elongated spores and the rest oval. All agreed with the definition of the genus *Monilia* given by VUILLEMIN, multiplying by means of " thallospores " consisting of swollen segments set free from the thallus and budding in basifugal progression like yeasts. This is, of course, not such a definition as would be ordinarily recognised by mycologists.

Vaccine treatment was tried with autogenous vaccines in 16 of the cases, but proved satisfactory in a few instances only.

The problem of the frequency, of the existence even, of bronchomoniliasis as a human disease is clearly posed in this paper. Its solution is not advanced. Mere frequency of association of an organism with a disease does not signify etiological connexion and is often a snare. The failure to correlate the intensity of the symptoms with the abundance of fungal elements and the absence of post-mortem evidence are serious justifications for the author's caution. Working on circumstantial evidence alone the series of examinations of sputum from healthy as well as from diseased cases requires to be greatly extended. The author has at least established the high frequency of occurrence of Monilia fungi in sputum and made more than ever urgent the recognition of the possible importance of the bronchomycoses generally.

E. J. Butler.

OTA (Masao). **Essai de classification des blastomycètes pathogènes.**—*Ann. Parasit. Humaine et Comparée.* Paris. 1924. Jan. Vol. 2. No. 1. pp. 34–61. With 12 figs. [17 refs.]

During the last two years the author has studied some 40 species [or strains] of supposedly pathogenic fungi belonging to the so-called " blastomycetes." The ascigerous forms encountered were all referable to the genus *Debaryomyces*, five species of which were discussed in an earlier memoir [Ota, *Ann. de parasitol.*, I, pp. 124–136, 1923], while a sixth, *D. Burnieri* n. sp., is now described and figured. The term " blastomycete " in current usage is considered to be badly defined and is limited in the present study to the forms devoid of ascospores and propagating by budding. To cover these forms only two genera, *Cryptococcus* and *Monilia*, are recognised, a crowd of other genera at present included amongst the pathogenic blastomycetes being discarded as properly belonging to one or other of these two. Further, it is admitted that the two genera maintained are joined by transitional forms and that their differentiation is at times very uncertain. *Cryptococcus* also is regarded as probably being merely *Saccharomyces* which has lost the facility for forming ascospores [what looks like typical conjugation is shown in a *Cryptococcus* in fig. 4], and it is evident that morphologically the distinction between the three genera is weak. It should be borne in mind that the genus *Monilia* (Gmelin) of the author is not that ordinarily known by this name amongst mycologists, the latter probably having no affinity to the yeasts.

In each case the morphology and cultural characters of the organisms are described and each is figured. Little information is given as to their pathogenicity, but the source of the culture is indicated. In many cases one would like to know what real evidence there is that they are not ordinary secondary saprophytes. Except where a specific name has already been given by previous workers, the forms are not named beyond the genus. On the whole, one is impressed by the author's commendable restraint and genuine desire to base his classification on recognizable characters of morphological worth and so to simplify the turgid classifications of the mycoses found in too many of the current works on parasitology.

E. J. Butler.

VERHOEF (A. W.). **Vergiftiging door Ketjoeboeng** (*Datura fastuosa*). [Intoxication by Ketjoeboeng (*Datura fastuosa*).]—*Geneesk. Tijdschr. v. Nederl.-Indië.* 1924. Vol. 64. No. 2. pp. 304–307.

A case is quoted of criminal poisoning with *Datura fastuosa*, which plant appears to be well known to the natives of the Malay Archipelago. The principal symptoms were excitation, loss of orientation, large pupils, dryness of the mouth. The patient recovered within a day. From the remainder of the chocolate in which the poison was administered a mydriatic alkaloid, probably scopolamine, could be obtained.

W. J. Bais.

KUIJER (A.). **Neosalvarsaan-intoxicaties.**—*Geneesk. Tijdschr. v. Nederl.-Indië.* 1924. Vol. 64. No. 2. pp. 339–351.

Kuijer describes several cases of neosalvarsan-poisoning, which he observed during a campaign against yaws in Java. The scarlatiniform exanthema is the lightest type. More serious reactions were the dermatitis exfoliativa generalis and haemorrhagic encephalitis, from each of which types of intoxication a patient died. The dose of neosalvarsan, previously 300–900 mgm., was later on decreased to mostly 4 doses of 400 mgm. in adult Javanese. The number of intoxications diminished.

W. J. Bais.

KIEWIET DE JONGE (G. W.). **De doodsoorzaken bij de verzekerden der N. I. Levensverzekering-en Lijfrentemaatschappij.** [The Causes of Death in the Lives Insured with the Dutch East Indian Life Insurance Company.]—*Geneesk. Tijdschr. v. Nederl.-Indië.* 1924. Vol. 64. No. 2. pp. 205–227. 1 chart in text. [6 refs.]

The author analyses the causes of death reported of 1,766 European and Eurasian men, 183 Chinamen and 74 native men. The figures do not allow much comparison, and therefore are mostly not of general interest. Yet some of the conclusions are worth while mentioning.

Enteric was an important cause of death (6·9 per cent. of the total 1912–22). The importance of vaccination is emphasized.

Malaria is gradually becoming of less importance in this respect (4·1 per cent. of total mortality, 1891–1911, 2·3 per cent., 1912–1922).

The mortality from smallpox is low, but still higher than in the army, where revaccination is more efficiently carried out.

Influenza did not cause a mortality of any importance during the epidemic of 1889 and following years. In 1918, however, it was very serious and it has since continued causing a few deaths.

The cholera mortality has much decreased, which the author ascribes chiefly to the vaccination which is very popular in times of epidemics.

The mortality from tuberculosis is lower than in Europe, but the Europeans in the East are a selected material in this respect. Surgical tuberculosis is less common than it is in Europe.

Cirrhosis of the liver is less prevalent among the causes of death than one would expect in a tropical country (0·7 per cent. of total mortality against 1·2 per cent. in European life insurance reports).

Bright's disease is a common cause of death (6 per cent.).

Suicide is common and appears to be on the increase.

Abscess of the liver is becoming a less important cause of death with the decreasing prevalence of dysentery.

Sunstroke only in one case was the cause of death; it is rare in the D.E.I.

Aneurysma aortae was the cause of death in 2 per cent. of the cases, which points to a far greater occurrence of this affection than in Europe.

A longer expectation of life is justified in Europeans and Eurasians than in natives or Chinamen.

W. J. Bais.

KEUKENSCHRIJVER (N. C.). **De afmetingen van het bekken van de Javaanschevrouw.** [The Measurements of the Pelvis of the Javanese Woman.]—*Geneesk. Tijdschr. v. Nederl.-Indië.* 1924. Vol. 64. No. 2. pp. 277–282. With 4 charts & 1 folding plate.

Founded upon the measurements taken in 1,000 living Javanese women, 130 post mortems and 10 cases in which the bony pelvis was removed from the dead body, the author found that the transversal diameter is smaller than in European women, whilst the conjugata vera is about the same in both races; the pelvis is more circular in shape. In 1 out of 6 cases the pelvis is of round or sagittal oval type. On the average there is a greater difference between the conjugata vera and inclinata than there is in European women. This difference is caused by the larger conjugata inclinata. The 25th vertebra is in a transitional stage. It may have the lumbar type or be united with the sacrum and intermediate types may occur. In Javanese the sacral fusion of the 6th lumbar vertebra is not yet complete. The pelvis is an assimilation type and accordingly in a more primitive phyletic stage of development.

W. J. Bais.

REVIEWS AND NOTICES.

Le Dantec (A.). **Précis de pathologie exotique (Maladies des pays chauds et des pays froids).** In 2 volumes. 4th Edition. Revised. Vol. 1. pp. iii + 942 and Vol. 2. 1232 pp. With 286 figs. & 3 coloured plates. 1924. Paris; Librairie Octave Doin, Gaston Doin, Éditeur, 8. Place de l'Odéon. (Collection Testut.) [Price 75 francs.]

Dr. Le Dantec uses the word pathology in its broader original sense of the science of disease, and his book is in fact a treatise on the diseases of warm and very cold climates. The three previous editions were published before the war, and a publisher's notice states that the work has now been brought up to date and certain chapters rewritten.

In the first part of the book the subject of climatology is considered at some length; then follows an account of tropical diseases, which is on the usual lines. There is a long chapter on malaria, concerning which the author holds some decidedly unorthodox views. Cholera is disposed of rather summarily, and the section on the treatment of this disease does not do full justice to modern work on the subject. The article on sprue, too, is somewhat inadequate. The third part of the book deals with the modifications of type of some cosmopolitan diseases which are often seen in warm countries. The last forty pages are devoted to the diseases due to cold, or which are met with in high latitudes.

The book is an interesting one, and is very well written. The author brings an original mind to bear upon his subject; and, although some of his opinions are not generally accepted, they certainly deserve careful attention.

H. J. Walton.

Urriola (Ciro Luis). **La valeur diagnostique du pigment hématique dans la malaria.**—pp. viii + 97. With 25 figs. 17 charts & 1 plate. 1924. Paris: Vigot Frères, Éditeurs, 23 rue de l'École-de-Médecine. [Price 12 francs.]

A medical man, accomplished, versatile, a post-graduate student at Paris, London and Dublin, a linguist, translator of several of Macaulay's works, a collaborator in Charcot's foundation the *Archives de Neurologie*, Vice-President and finally acting President of the Republic of Panama—such was Ciro Luis Urriola. He held withal the conviction that he had discerned in serum and urine special pigments diagnostic of malaria, a matter which lay so near his heart that this posthumous publication has been selected by his widow as a fitting tribute to his memory.

Seeing that examination of cutaneous blood may fail to detect plasmodia when they are certainly present in the circulation Urriola was delighted when satisfied that by his detection of "haematic pigments" in serum and urine he could infallibly detect malaria, using the following technique. Urine is centrifuged for five minutes (rate unstated), after which, in a drop removed from the *middle* layers, are found floating characteristic coal-black pigment as very fine grains loosely aggregated in bands, as fine flocculi, as large polymorphous masses, and within hyaline plates. In the sediment are found yellow pigment as fine grains, as grains or masses isolated or grouped, and as drops; and blue pigment, rare, nearly always in isolated masses or included in hyaline bodies.

Accepting these pigments as malarial, their widespread presence implicates as malarial affections, fevers entirely resistant to quinine, haemoptysis, pneumonia, orchitis, haemoglobinuria, sensations of heat and cold, oedema of various parts, elephantiasis, abdominal pain, repeated abortion, beriberi,

Is this logical superstructure built on firm foundations? What evidence, in other words, is offered that these pigments are malarial? Parasites were detected in none of the 115 cases quoted evidentially. Proof of the association of these pigments with parasites and their absence in cases where malaria could be excluded is not tendered.

The last chapter describes how, using a seven per cent. solution of chlorate of potash, or a mixture of this and sea water, Urriola observed in blood, whether malarial or not is unstated, the development of crescents and of definite ciliated organisms, the multiplication of leucocytes by fission again with the formation of crescents. In a mixture of white of egg and gum-arabic giant cells arose, giving rise by division to daughter cells, which might be like the parent, might be provided with cilia or with flagella, or might be crescents. "Dans ce cas, le fameux aphorisme de Virchow *omnis cellula e cellula* paraît en défaut." To the possibility of, or to any means used to avoid, contamination of the media by free-living organisms no reference is made.

Clayton Lane.

FRASER (H.) [M.D., D.P.H., Deputy Commissioner of Medical Services, Ministry of Pensions; formerly Director, Institute for Medical Research, F.M.S.] & STANTON (A. T.) [M.D., M.R.C.P., D.P.H., Director of Govt. Laboratories, F.M.S., ; formerly Bacteriologist, Inst. Med. Res. F.M.S.]. **Collected Papers on Beri-Beri.**—*Studies from the Institute for Med. Res. Federated Malay States. No.* 17. pp. vi + 103. With 7 plates. 1924. London: John Bale, Sons & Danielsson, Ltd., 83–91, Great Titchfield Street, W. 1. [Price 7s. 6d.]

The ten papers here conveniently collected made their several first appearances in the ten years 1909–1918. Four of them—published in 1909, 1910, and 1911—contain the detailed history of the authors' classical researches into the causation of beriberi. The conclusions originally drawn by the authors from these researches—namely, that beriberi is a disorder of nutrition incident on a staple diet of rice that has been deprived of vitalising essentials by excessive process of milling and polishing—have received, and, indeed, have commanded, almost universal acceptance; though whether they contain the whole and final and exclusive truth of the matter has been questioned by MEGAW, who recently has put some sparks of light (and perhaps of life) into the spoilt-rice-toxin theory of BRADDON. The question may perhaps be one for clinical experts with their definitions and classifications; but whatever the upshot, the work re-introduced in these collected papers has a permanent value and repute as being one of the earliest and most influential experimental contributions to the development of the vitamin concept.

Numerous verbal changes have been made in the reprinted papers, but the sense has not been altered.

A. Alcock.

MANSON-BAHR (Felipe H.). **Enfermedades Tropicales. Traducción Española de la séptima edición Inglesa.**—pp. x. + 802. With 21 coloured and 6 black-and-white plates, 404 text figs. & 31 charts. 1924. Barcelona: Salvat Editores, S.A. 41, Calle de Mallorca 49.

This is a well-presented Spanish edition, with all the plates and the many text-figures admirably reproduced, of the seventh edition of MANSON'S classical text-book of Tropical Diseases edited by Dr. Manson-Bahr, which was reviewed in Vol. 17, p. 342, of this *Bulletin*. In this new appearance in a becoming dress the book is assured of an appreciative reception.

A. Alcock.

TROPICAL DISEASES BUREAU.

TROPICAL DISEASES BULLETIN.

Vol. 21.] 1924. [No. 9.

AMOEBIASIS AND DYSENTERY.

AMOEBIASIS.

SELLARDS (Andrew Watson) & THEILLER (Max). **Investigations concerning Amoebic Dysentery.**—*Amer. Jl. Trop. Med.* 1924. May. Vol. 4. No. 3. pp. 309–330. [6 refs.]

Very little information exists concerning the conditions which govern the excystment and encystment of *E. histolytica.* The generally accepted argument is that it excysts in the small intestine and that a patient cannot be re-infected with his own cysts so long as these remain in the large intestine. To test the point, specimens of faeces containing cysts of *E. histolytica,* but no trophozoites, were injected directly into the large bowel of kittens; 6 out of 8 animals became conclusively infected. Next, to eliminate the possibility of the infected animal swallowing cysts passed by itself, the large bowel was occluded at the junction of the lower and middle thirds and cysts were then injected directly into the lumen above the ligature. Three days later the bowel showed extensive deep ulceration and erosion of the mucosa and the bowel contents actively motile phagocytic entamoebae; below the ligature there were no lesions and no amoebae were found. This and other similar experiments suggest that excystation of *E. histolytica* occurs in the large bowel and is favoured by stasis. Excystation occurs under those conditions which are unfavourable for the development of trophozoites. The results of subsequent experiments indicate that a liberal supply of water is essential for successful excystation and infection. Water is absorbed so rapidly from the large intestine that the moisture of its contents is dependent upon the continued supply of fluid from the small bowel. When a ligature was placed around the middle of the colon and entamoebae were injected above and below the ligature, the bowel above the ligature was dry and free from lesions and entamoebae, while below there was an intense amoebic infection. These facts suggested that curative effects could be produced in kittens by depriving the large intestine of its supply of moisture by placing a ligature round the gut; the entamoebae disappeared promptly in the animals in which this procedure was carried out early in the course of the infection. According to this conception of the disease, the cysts of *E. histolytica* when ingested by mouth are carried rapidly by peristalsis through the small bowel and set up lesions at points of stasis in the large intestine, In three kittens amoebic infection rapidly invaded the ileum when the ileocolic sphincter was rendered functionless. On the other hand, ligature of the small bowel and inoculation of active amoebae immediately above the ligature failed to produce infection. This failure suggests that the environmental conditions of the ileum are unfavourable for the development of the entamoebae.

P. H. Manson-Bahr.

SMITH (S.). **Amoebiasis in Secunderabad.**—*Jl. Roy. Army Med. Corps.* 1924. May & June. Vol. 42. Nos. 5 & 6. pp. 321–330; 438–446. With 4 charts. [12 refs.]

The average admission rate for dysentery in Secunderabad during the last eight years has been 38·12 per mille, as compared with a corresponding rate of 10·18 per mille for India as a whole. In 1913 the dysentery curve for British troops showed an abrupt rise to 23·9 per mille, the average for the previous four years being 5·9 per mille. Records taken at this station during the last nine years show a definite increase of cases of amoebiasis during July and August, but the incidence of dysentery in Indian troops does not show this seasonal variation to the same degree. The "evenness" of the incidence of amoebiasis amongst various British units has been remarkable; this does not point to the spread of the infection by any individual carrier; but the corresponding seasonal incidence of simple diarrhoea and dysentery in 1923 points to some general infecting agent, *e.g.*, the house-fly, the water-supply being above suspicion. The only departure from the normal blood-picture in nine cases was a moderate eosinophilia. About one fifth of the cases were associated with colic and constipation—or "pseudo-appendicitis" group. Clinically the cases can be divided into the *acute fulminating* or *choleraic*, the acute *toxic*, the acute *non-toxic*, and the *chronic* or mild. Out of 110 cases 13·6 per cent. relapsed. Of this number 33⅓ per cent. relapsed a second time and 60 per cent. of these relapses a third. Statistics of British and Indian troops show that the former are seven times more liable to hepatic complications than the latter, while similar statistics demonstrate that though in the years 1917–1920 dysentery is almost three times more common in the southern than in the northern army, yet hepatic complications predominate in the latter. The average age incidence of 46 cases of hepatitis was found to be 27·8 years and that of liver abscess 34·7 years. The types of hepatitis may be classified into *generalized* and *acute localized.* Only two cases of liver abscess were recorded; both recovered on aspiration treatment.

P. H. M-B.

GIOSEFFI (M.). **Esiste in Italia la dissenteria amebica?**—*Riforma Med.* 1924. Feb. 11. Vol. 40. No. 6. p. 141.

Respecting the existence of amoebic dysentery in Italy before the Great War, the author calls attention to cases from Istria and Trieste seen by him in 1906 and reported in the *Gazz. degli Ospedali e delle Cliniche,* No. 12, 1910. He saw eight patients, of whom four died. The symptoms were typical and the diagnosis was confirmed by the finding of the amoeba (Charcot-Leyden crystals were found in the observed diarrhoea of varying intensity. Their results confirm those of DOERR to the effect that dysentery toxin is destroyed after being heated to 80° C. for three minutes.

In the case of rabbits, individual differences in the sensitiveness of the systems affected were observed; sometimes nerve symptoms, at others intestinal symptoms were more pronounced.

They therefore endeavoured to settle the question by serological methods and prepared sera which could, according to their origin, be designated antitoxic and anti-endotoxic, but experiments on animals with these sera, with living bacteria, and with extracts and toxins, revealed no qualitative differences and no special affinities with particular antigens.

Only in the agglutination test did the anti-endotoxic sera prove more potent. They concluded that for the purposes of standardization it is sufficient to determine the antitoxic properties of the serum. For the purposes of antitoxin production large doses of toxin should not be employed. Wherever possible the same breed of rabbit should be used throughout an entire series of experiments and when careful titration is adopted, cases where death occurs within twenty-four hours should be disregarded. Rabbits are preferred to mice, while 5–10 toxic doses of bouillon toxins should be employed.

Standardisation of Anti-Dysentery Serum. Interim Report transmitted by the Medical Research Council. [O'BRIEN, SUDMERSEN, EAGLETON, MACCONKEY & PETRIE.] pp. 157–159.

At the Wellcome Physiological Research Laboratories one sample of a Frankfort toxin and antitoxin were tested; the former had greatly deteriorated; the antitoxin, however, protected regularly and satisfactorily. In this case 1 mgm. of dried dysentery (Shiga) bacilli was mixed with dilutions of the serum to be tested and after half an hour was injected intravenously into a rabbit. The amount of serum necessary to neutralize the test dose of toxin was called 1 unit.

The agglutinating properties of the serum did not run parallel to the protective antibodies. If the toxin is kept hermetically sealed in phials it is found that the M.L.D. remains constant. Workers at the Lister Institute find that the toxin remains constant when stored in a desiccator in a cold room. Using pure " Shiga " toxin, sera may be obtained each cc. of which will neutralize from 1,000–6,000 M.L.D.s, but a similar titre is much more difficult to obtain when horses are immunized with *mixed* Shiga and Flexner strains.

Dysentery Serum. Report. [SHIGA (K.).] pp. 160–168.

The author describes the types of *B. dysenteriae* and directions for the manufacture of anti-dysentery serum; in the standardization of the latter mice are employed. Using the intraperitoneal method the M.L.D. is 0·1 to 0·08 mgm. for a mouse of a body weight of 12 to 14 gm.

For standardization 5 times the M.L.D. is added to a certain amount of serum. The quantity of serum which measures less than 0·0025 cc. and possesses protective power against 5 times the M.L.D. is considered effective.

P. H. M-B.

of the question as to what really should be measured. The exigencies of practice have led to the fusing of both principles of serum production and serum testing.

In titrating the toxin, experiments were carried out with rabbits and white mice—animals susceptible to the toxins. The substance was inoculated into the auricular vein of the rabbit or the caudal vein of the mouse and the following conclusions were reached :

A filtrate which is non-toxic for rabbits is equally so for white mice and *vice versa,* and there is considerable parallelism in the response of both types of animal. On the whole, the minimum lethal doses for rabbits and white mice are in the ratio of 5 : 1, but on the basis of their relative body weights, white mice have 20 times more resisting power to the Shiga toxin than rabbits. From the identity of the symptoms of poisoning in both species of animal it is evident that it is a *homogeneous toxin* which affects them both.

Whether alterations in the intestines take place in the case of rabbits after inoculation of the toxin solution depends upon factors which are governed by the condition of the animals at the time of the injection. This is the only explanation for the fact that the same dose of one and the same *toxic-filtrate* may produce serious, slight, or no changes in the intestine. After weighing up the advantages and disadvantages of the two types of laboratory animal it is urged that the use of rabbits for purposes of testing dysentery toxins and corresponding antitoxins should be maintained and white mice should not be substituted for them.

The titration value of antitoxic dysentery sera was carried out to a great extent on mice. The titration was effected by inoculation after preliminary mixing of the toxin and antitoxin *in vitro* (10–15 times the lethal dose of toxin with graduated quantities of serum, the mixture to be left standing for one hour at 37° C.). As stated above, uniform results can only be obtained if rabbits are used. Observations furnish no grounds for believing that sera which are found to be of a high therapeutic value produce better results in the treatment of dysentery patients than sera which are highly antitoxic in the ordinary sense of the word. Normal horse serum does not neutralize Shiga toxins.

Study on the Methods of Titration of Anti-Dysentery Serum. [DOPTER.] pp. 116–117.

This investigator has attempted to verify the existence of endotoxins and exotoxins produced by the dysentery bacillus, but so far has failed to do so.

The best antitoxic serum was obtained from horses inoculated subcutaneously with toxin from cultures in bouillon left in the incubator at 37° C. for one week.

Investigations regarding Dysentery Toxin and Antitoxin. [GIESZCZYKIEWICZ (Marjan) & LIPINSKI (Witold).] pp. 118–126. [3 refs.]

The authors repeated the experiments of OLITSKY and KLIGLER on dysentery toxins [see this *Bulletin,* Vol. 16, p. 18], but were unable fully to confirm them, notably the isolation of the neurotoxin from the enterotoxin. Simultaneously with paralysis of the extremities they stools), by the development of liver abscess in one patient, and by the post-mortem findings in the fatal cases. The bacillary variety is, however, much more frequently encountered. [See also this *Bulletin*, Vol. 21, p. 346.]

H. Harold Scott.

PETZETAKIS. **Beobachtungen ueber eine durch lebende Entamöben im Anschluss an Amöbenruhr verursachte Bronchitis. Nachweis von lebenden Entamöben im Sputum und Harn.** [Bronchitis caused by Entamoebae in Succession to Amoebic Dysentery. Demonstration of Living Entamobae in Sputum and Urine.]—*Klin. Woch.* 1924. June 3. Vol. 3. No. 23. p. 1026.

A German version of similar papers by the same worker which have already been noted in this *Bulletin*. He has recently investigated the sputum and urine in 34 cases of amoebic dysentery and has found in three (8 per cent.) living entamoebae in the sputum and in the urine in 7 (14 per cent.). The organisms in the sputum were not, he thinks, examples of *Entamoeba buccalis* as the specimens were taken after the oral cavity had been well disinfected.

P. H. M-B.

PANAYOTATOU (Angélique). **Amibiase familiale à localisations différentes. Amibiase intestinale chez la fille. Amibiase bronchique chez le père.**—*Bull. et Mém. Soc. Méd. Hôpit. de Paris.* 1924. Apr. 3. Year 40. Vol. 48. Ser. 3. No. 12. pp. 406–410. [1 ref.]

Inspired by her discovery of amoebic bronchitis the author reports a case occurring in a family of refugees from Asia Minor with one of amoebic dysentery in a girl of eleven years of age. The bronchitic patient, a man of forty-eight years of age, was in an enfeebled and distressed state. The viscid sputum showed a few living and numerous dead *Entamoeba histolytica* as well as cysts. Some of the organisms on a hot summer day remained alive for twenty-four hours. In size they varied from 25–35μ; the cysts, 10–14μ, contained three or four nuclei, some only two. The two cases, the author thinks, had contracted their infection from the same source, but the organism had given rise to intestinal symptoms in one case, bronchitic in the other. Both made a good recovery on emetine.

P. H. M-B.

PANAYOTATOU (Angélique). **L'amibiase des voies urinaires en Égypte.**—*Rev. Méd. et Hyg. Trop.* 1924. Apr. Vol. 16. No. 4. pp. 107–115.

The author in Alexandria has recently diagnosed and treated four cases of cystitis and two of nephritis of amoebic origin. In the urine of the cystitis cases dead and living amoebae and their cysts were passed; the nephritis cases presented the clinical picture of inflammation of the kidneys and their urine contained living and dead amoebae, but not cysts. The infection, she thinks, follows upon long standing intestinal amoebiasis, although in the case of nephritis no history of bowel infection was obtainable. The nephritis can be checked with a few doses of emetine.

The urine from one of these cases was injected into the rectum of a kitten and it developed dysentery and died on the 10th day, while another animal placed in its vicinity also succumbed with typical bowel lesions at autopsy.

P. H. M-B.

QUESADA (Fortunato). **Algunos casos de falsas apendicitis disentéricas.**—*Gac. Med. Peruana.* 1924. Jan. & Feb. Vol. 2. Nos. 13 & 14. pp. 23–27.

The author relates the main points of four cases sent into his hospital with a diagnosis of appendicitis. In all such cases examinations were made of the blood, urine and faeces. In the first patient the faeces contained ova of *Ascaris lumbricoides*, and treatment by santonin brought about a cure in four days. In the other three, *Amoeba histolytica* or its cysts were found and injections of emetine cleared up the conditions. [It is noteworthy that in no instance was there a rise of temperature or alteration of the pulse, and the highest leucocyte count was 10,000 per cmm. These facts should suffice as a warning against too hasty a diagnosis of appendicitis, the only suggested symptom in these cases being the pain and its site.]

H. Harold Scott.

MILLS (Lloyd). **Amoebic Iritis occurring in the Course of Non-Dysenteric Amoebiasis.**—*Arch. of Ophthalm.* 1923. Nov. Vol. 52. No. 6. pp. 525–545. [25 refs.]

In "toxaemic iritis" the teeth, tonsils, nasal, respiratory, genito-urinary and intestinal tracts serve in some cases as a source of septic infection. Although the etiology of the majority of these cases has now been settled by the isolation of various organisms from the eyes, there still remains a residuum usually chronic in type whose origin is obscure. In the four cases recorded in this paper bilateral iritis was associated with chronic constipation, secondary anaemia, colon tenderness and the presence of *Entamoeba histolytica* in the stools. One is related in detail. A lady of 44 had suffered from iritis for nearly 12 years, with chronic constipation, necessitating frequent enemata. In April 1921 the pain became intense, the iris being highly vascularized, while the large vessel trunks twining through the reticulum of the iris stood out like " stout vines through a trellis." The eye was enucleated and shortly after the left became similarly affected ; finally an examination of the faeces revealed many " inactive Chilomastix, and a predominant number of Blastocysts and cocci " and ultimately large numbers of *Entamoeba histolytica* (whether encysted or free is not stated). Antiamoebic treatment consisted in the administration of powdered ipecacuanha in keratin-coated tablets together with $\frac{1}{3}$ gr. of emetine hydrochloride intramuscularly. Treatment continued over five months appears to have resulted in the cure of the iritis. Three other somewhat similar cases are described, in none of which was there history of diarrhoea or dysentery. The author concludes that in all cases of chronic intractable iritis of uncertain and obscure origin, especially in those patients who suffer from gastro-intestinal disorders, protozoan, and particularly amoebic infections, must be considered as a possible origin of the ocular inflammation.

[This inference requires careful consideration, quite apart from its novelty. Undoubtedly conjunctivitis and iritis are among the recognized complications of bacillary dysentery, being due to absorption of the dysenteric toxins, and not, so far as is known, to the presence of the bacilli in the eye. The lesions of amoebiasis, on the other hand, even when extensive, are not usually accompanied by a generalized toxaemia, but are due to the activities of the specific amoebae. Dr. Mills, however, so far from producing the necessary evidence that pathogenic amoebae were present in the eyeball, states that the excised eye was not even microscopically examined. The evidence from the other three cases cannot be considered satisfactory or convincing. One is quoted on hearsay evidence as having occurred as long ago as 1912. In this case the *E. histolytica* were recorded in the stools and were banished by emetine treatment. As the patient was constipated it was probably the cysts which were observed, and at that date accurate identification of cysts was not possible, since it was not till the following year (1913) that WALKER and SELLARDS established the difference between the cysts of *E. histolytica* and *E. coli.* The author lays great stress upon the effects of antiamoebic treatment as confirmatory evidence, and we note that in the first instance emetine and ipecacuanha treatment were initiated over one year after a positive diagnosis had been made, though no exact reasons are given for the delay; in case No. 3 no appreciable improvement is recorded as having taken place.]

P. H. M-B.

FRANÇON (F.) & HUTINEL (J.). **Technique, posologie, incidents et accidents du traitement de l'amibiase hépatique par l'émétine et le novarsénobenzol.**—*L'Hôpital.* Paris. 1924. Mar. Vol. 12. No. 115. pp. 167–170. [2 refs.]

The authors believe that the best results in the treatment of amoebiasis are obtained by a combination of emetine and novarsenobillon, which for distinctiveness and convenience they designate ENV. The depressing effects of emetine are more than counterbalanced by the stimulating action of the novarsenobillon. They consider that 8 cgm. should suffice for an individual dose of emetine. The course advocated is as follows:—

Acute attack: first series, seven injections, the first two of the series 8 centigrammes each, the remainder 6 centigrammes; fifteen days' rest. Second series, seven injections of 6 centigrammes each; three weeks' interval. Third series seven injections of 5 centigrammes each.

Chronic stage: first series, six injections of 8 centigrammes each; one months' interval. Second series—five injections of 6 centigrammes, then every two months 6 centigrammes given daily for one week.

The posology for children is worked out as follows:—

	Daily dose.	Total dosage.
Under one year	0·5 cgm. ..	5 cgm.
From 1–2 years	1 „ ..	10 „
From 3–5 years	2 „ ..	20 „
From 5–9 years	3 „ ..	30 „
From 10–13 years	4 „ ..	40 „

In the method known as ENV four injections of novarsenobillon of 30 cgm. each are given at four days' interval, while on each of the three intervening days emetine is injected in gradually increasing doses from 4–8 cgm. when the emetine is suspended and the novarsenobillon injections are continued in ·3 gm. doses every four days till a total of

10 injections have been administered. After the seventh a fresh series of emetine injections in similar quantities is given.

In 40 days over 1 gramme of emetine will have been administered and 3 grammes of novarsenobillon. No serious reactions have been noted.

P. H. M-B.

BENSAUDE, CAIN & RACHET. **Les injections intraveineuses de chlorhydrate d'émétine dans le traitement de la dysenterie amibienne.**—*Bull. et Mém. Soc. Méd. Hôpit. de Paris.* 1924. May 15. Year 40. Vol. 48. 3rd Ser. No. 16. pp. 662–670. [1 ref.]

This is a response to the article of PETZETAKIS (see this *Bulletin*, Vol. 21, p. 342) on intravenous injections of emetine in acute intestinal amoebiasis and specially in the refractory and chronic forms of this disease. It has been shown that emetine is much less toxic when given by the intramuscular than by the intravenous route and that the drug may exert an immediate or a cumulative action; but PETZETAKIS does not appear to believe in the toxicity of the drug, although some of his patients exhibited polyneuritic symptoms.

In two cases where intravenous emetine was exhibited in the present report the initial dosage was 0·04 gm., the maximum individual dose 0·06 gm. diluted in 100 cc. and 20 cc. of normal saline respectively. One to three days elapsed between individual injections, while camphorated oil, caffeine and adrenalin were simultaneously exhibited and the patient was confined to bed. The results were by no means favourable. The second patient exhibited marked polyneuritic symptoms after 0·92 gm. of emetine, becoming inarticulate and partially paralysed.

The immediate symptoms of emetine toxaemia supervene ¼-1 hour after the injection and consist of nausea and vomiting, which may persist for the remainder of the day. Delayed toxic symptoms are due to the cumulative action of the drug and consist of asthenia, polyneuritis and cardiac involvement.

P. H. M-B.

LUDLOW (A. I.). **Treatment of Abscess of Liver by Aspiration and Subcutaneous Injections of Emetine.**—*China Med. Jl.* 1924. Feb. Vol. 38. No. 2. pp. 93–102. [6 refs.]

The subject of liver abscess has been considered by the writer in three previous papers—comprising over 100 cases. [See this *Bulletin*, Vol. 20, p. 706.] Recent experiences relating to 10 cases for the year June 1922–1923 are based entirely on the results of aspiration combined with subcutaneous injections of emetine. The protocols of the ten cases (all Koreans) are given. The comparative number of female cases (2) is higher than that recorded for other countries. The use of alcohol appeared to be a predisposing factor, and nine out of the ten gave a history of antecedent attack, or attacks, of amoebic dysentery. All abscesses occurred in the right lobe of the liver, the amount of pus on aspiration varying from 60 to 2,350 cc. The patients were infested with various other parasites—Paragonimus in two, Ancylostoma in one, Trichuris in six, and Ascaris in five. In four cases there was no appreciable leucocytosis.

In earlier years the author was not convinced that the use of emetine hastened recovery, except when amoebic dysentery was active; but probably the dosage was too small. As regards aspiration, the site of the puncture chosen was the ninth interspace in the anterior axillary line, but, if there is a marked swelling below the costal margin or in the epigastric region, these points should be chosen. The needle should be inserted to a depth of not more than three, or, at the most, four inches. A small skin incision facilitates the introduction of the trochar. A glass (30 cc.) syringe connected with the trochar by a short, stiff rubber tube makes a simple aspirator; if the pus be too thick 20–30 cc of Dakin's solution should be injected. All pus should be evacuated, if possible, at one aspiration; an effusion of serum seems to take place into the cavity. Daily injections of emetine (0·06 gm.) should be continued for 6–10 doses. Should the pus prove too thick for aspiration open operation should be resorted to.

The advantages are:—Aspiration can be done under local anaesthesia, while the open method usually requires a general anaesthetic. The patient is saved the shock of an operation and the annoyance of dressings and insertion of tubes. There is less chance of secondary infection. The time in hospital is much shortened (in the ten cases it averaged 11 days). There were no deaths. Should aspiration fail, the patient is in better condition for subsequent open operation.

P. H. M-B.

DELANOË (P.). **Un cas de dysenterie amibienne grave traitée par le stovarsol.**—*Bull. Soc. Path. Exot.* 1924. Feb. 13. Vol. 17. No. 2. pp. 119–122. [3 refs.]

In a second case of amoebic dysentery stovarsol appears to have had beneficial results—a lady who seemingly had a very severe attack commencing in April, 1923. Emetine injections and permanganate lavages had little effect, but rapid amelioration took place on stovarsol (dose not stated). [The record is by no means convincing that an absolute cure had been attained.]

P. H. M-B.

LYNCH (Kenneth M.). **Ingestion of Red Blood Corpuscles by an Intestinal Amoeba with Eight-Nucleated Cyst.**—*Amer. Jl. Trop. Med.* 1924. Jan. Vol. 4. No. 1. pp. 43–48. [4 refs.]

"An intestinal amoeba which is not *Endamoeba histolytica*, but which may be identified as *Endamoeba coli* by a liberal interpretation of such features as motivity, nuclear construction, thickness of cyst wall, shape of cyst, affinity for stain, and character of chromatoidal bodies, coming from a person who has had no recognizable harm from it, readily ingested red blood corpuscles in the test tube on one occasion but failed to do so on another," is the author's summary.

A. Alcock.

i. FRANÇON (F.) & HUTINEL (J.). **Les données nouvelles sur l'amibiase hépatique.**—*Bruxelles-Méd.* 1924. May 29 & June 1. Vol. 4. Nos. 51 & 52. pp. 924–933; 940–946. [12 refs.]

ii. ROUILLARD (J.). **Amibiase pulmonaire et bronchites amibiennes.**—*Presse Méd.* 1924. June 7. Vol. 32. No. 46. pp. 502–504. [8 refs.]

iii. PANAYOTATOU (A.). **Sur quelques cas nouveaux d'amibiase extra-intestinale.**—*Bull. Soc. Path. Exot.* 1924. Mar. 12. Vol. 17. No. 3. pp. 211–214.

iv. LOISELET (J.). **Diagnostic et traitement de l'amibiase pulmonaire.**—*Rev. Prat. Malad. des Pays Chauds.* 1924. Feb. Year 2. Vol. 3. No. 6. pp. 429–446.

v. Kofoid (Charles A.) & Swezy (Olive). **A Note on Dr. Gunn's Difficulties with Councilmania.**—*Jl. Parasit.* 1924. Mar. Vol. 10. No. 3. pp. 153–157. [7 refs.]

i. Contains no original information.

ii. Contains no original observations, but is a review of recent literature on this subject.

iii. The cases recorded are two of chronic bronchitis and asthma complicated with pulmonary amoebiasis, fever and haemoptysis.

iv. A *résumé* of the previous literature of pulmonary amoebiasis as well as of the recent papers of Leclerc, Ramond, Denoyelle and Lautman, as well as of Petzetakis, all of which have been reviewed in this *Bulletin.*

P. H. M-B.

v. This is a controversial paper. It contains nothing new. The authors maintain that *Councilmania lafleuri* is a distinct species verifiable by those peculiarities of its cyst which have already been described and figured.

A. A.

BACILLARY DYSENTERY.

Megaw (J. W. D.) & Maitra (G. C.). **Chronic Dysenteric Peritonitis as the Probable Cause of a Common Form of Ascites in the Tropics.** —*Indian Med. Gaz.* 1924. May. Vol. 59. No. 5. pp. 228–232.

Ascites is a very common condition in India—at autopsy no cirrhosis of the liver is evident, but the chronic fibrosis is of the peritoneum itself. On enquiry it is found that the majority of the cases have had severe dysentery or diarrhoea shortly before. It is believed that the peritonitis is originally caused by the passage of the dysentery toxins from the bowel to the peritoneal cavity. Ascites is more likely to occur among patients who continue to be carriers of dysenteric infection: agglutinins would be more likely to persist among these carriers than among an average series of cases of recovered bacillary dysentery. In making the agglutination tests the following procedure was followed:—The bacterial emulsions were made from 18–20 hours' old agar emulsions of organisms isolated locally, the strains being kept constant, the emulsions being standardized to a definite capacity. Tubes were left in the incubator at 37°C. for two hours over a bowl of water to prevent evaporation. Readings were taken at half an hour and at room temperature. The best prospect of controlling the disease lies in the proper treatment of bacillary dysentery by salines.

The subjoined table gives a summary of the results of examinations for evidence of infection with dysentery bacilli:—

	Agglutination Response to Flexner Bacilli.					Stool Cultures for Shiga and Flexner Bacilli.		Total.
	Negative.	+1:10	+1:20	+1:40	+1:80 and over	Positive.	Negative.	
Dysenteric Ascites Group	2	0	2	2	4	2	8	10
Controls with History of Recent Dysentery	9	2	2	3	3	3	16	19
Controls giving no History of Recent Dysentery	23	7	5	4	1	0	40	40

[See also Megaw, this *Bulletin*, Vol. 19, p. 40.]

P. H. M-B.

LA FAVRE (H. B.). **Epidemiological Report of an Outbreak of Bacillary Dysentery at the Marine Barracks Rifle Range, Santo Domingo City, Dominican Republic.**—*U.S. Nav. Med. Bull.* 1924. June. Vol. 20. No. 6. pp. 797–800.

A small epidemic of bacillary dysentery in the Marine Barracks at Santo Domingo was attended by unusual features. The disease had been endemic in Santiago for some time and the infection was imported by a small detachment of men from that city. The first case appeared four days after their arrival. There were in all 67 cases, involving 20 per cent. of the command; only 10 were sent to hospital. The responsible organism was the Flexner bacillus. Stringent precautionary measures were taken with regard to the water supply, in which traces of faecal contamination were discovered. The author is satisfied that the outbreak is to be attributed to this source.

P. H. M-B.

SEMERAU (M.). **Zur Pathogenese der Ruhr.**—*Wiener Arch. f. innere Med.* Vienna. 1923. July 1. Vol. 6. pp. 395–406. [31 refs.]

It has been generally accepted that the dysenteric lesions in the intestine are due to the diffusion of the dysenteric toxin by the blood stream, but there has been no adequate explanation of the limitation of the process to the lower sections of the digestive tract. (It is generally accepted that the organisms gain entrance to the body through the mouth, though it has been shown that under normal conditions the introduction of a moderate number of dysentery bacilli into the intestinal canal does not suffice to produce an attack of "clinical" dysentery.) The diphtheritic inflammation of the rectum must probably be regarded as the result of the excretion by the mucous membrane there of bacillary toxins produced elsewhere; the intestinal lesions thus have a twofold origin: they are due first to the entrance of the organisms into the bloodstream, and then to excretion of their toxins. Although it is generally stated that dysentery bacilli cannot be demonstrated in the bloodstream in cases of dysentery, the author does not believe this to be strictly correct, for he has collected a number of observations of KOSTRZEWSKI, who demonstrated Shiga Kruse bacilli in the blood of 28·7 per cent. of his dysentery cases.

Intravenous injections of dysentery cultures provoke in laboratory animals the characteristic necrotic changes in the mucous membrane of their intestinal canal. The failure of bacterium-free filtrates to provoke the same lesions is probably to be attributed to the absence of endotoxins in such solutions. Under normal conditions of acid secretion in the gastric juice the dysentery bacilli are rapidly destroyed on gaining entrance to the stomach. It may be that on occasions the organisms are filtered by the liver and find their way into the gall bladder, where the bile forms an efficient medium for their multiplication.

P. H. M.-B.

ROBINSKI. **Das Syndrom der chronischen Ruhr.**—*Med. Klin.* 1924. Feb. 17. Vol. 20. No. 7. pp. 214–215. [13 refs.]

Ulcerative colitis is now generally regarded as a sequel of bacillary dysentery. It is not usually the most severe forms that become chronic, but the typical syndrome develops after a longer or shorter latent period, with variations in individual cases. Except for occasional attacks of diarrhoea which may escape regard, the actual onset either intervenes in some other illness or takes place after severe exertion. Sleeplessness and lack of energy, tachycardia, etc., may be noted; arthritic symptoms may occur; while any dietetic error, especially the ingestion of milky or starchy foods, is liable to provoke an attack. The general appearance of the patient is one of profound cachexia. The agglutination test with dysentery bacilli may furnish a diagnosis; usually a titre of 1 : 100 against the Y bacillus is obtained; but often coagglutinins render the employment of the absorption test necessary. Demonstration of the specific organisms in these cases is very difficult.

P. H. M-B.

HAUVUY (L. E.). **Arthrite purulente du genou d'origine dysentérique bacillaire jugulée par la sérothérapie.**—*Arch. Med. et Pharm. Milit.* 1924. May. Vol. 80. No. 5. pp. 465–467.

The author records a case of acute purulent arthritis developing during the course of an acute dysentery. The knee was the joint most affected, puncture of the joint cavity yielding a purulent fluid containing an excess of polymorphonuclear leucocytes. The effusion disappeared twenty-four hours after the injection of antidysenteric serum. There were seven other cases of acute dysentery in the barracks at the time.

P. H. M-B.

BROKMAN (Henryk). **Badania nad wrażliwością skórną ludzi na jad czerwonkowy. Experiments on the Sensibility of the Skin of Man to the Toxin of B. Shiga-Kruse.**—*Medycyna Doświadczalna i Społeczna.* Warsaw. 1924. Vol. 2. No. 3–4. pp. 143–151. English summary p. 152.

By injecting certain doses of Shiga toxin a positive cutaneous reaction is obtained in about 80 per cent. of normal men, but it is always negative if the serum is first heated to 100° C., or neutralized *in vitro* with antitoxin. The reaction is negative in men previously injected with antitoxin, and possibly a negative reaction may coincide with immunity to dysenteric infection.

P. H. M-B.

DUTTON (L. O.). **Technic for the Bacteriologic Diagnosis of Bacillary Dysentery.**—*Jl. Lab. & Clin. Med.* 1924. Apr. Vol. 9. No. 7. pp. 463–468.

Recognizing the necessity for rapid and accurate diagnosis in bacillary dysentery the author worked out a method by which positive results could be obtained, as is so desirable, in 12–15 hours. The technique, which was fully controlled, consists of plating out the faeces, or preferably mucus taken from the rectum, on to eosin-methylene-blue agar containing 0·5 per cent. each of lactose, saccharose and glycerine adjusted to pH 7·2. Suspected colonies are picked out and at least three transplanted on to Krumweide's triple sugar tubes. At the same time a mixture of several colonies is emulsified in a drop of 1 in 30 polyvalent antidysenteric serum and mounted for slide agglutination, which should be observed over a period of one hour; a partial agglutination at the end of that time is considered as presumptive diagnosis of dysentery. The growth from the triple sugar tubes is transplanted to dextrose, maltose, mannitol and sucrose in agar with brom-cresol as the indicator, and acid formation is observed for 48–72 hours. This long period is for the purpose of giving time for the Flexner bacillus to ferment maltose, but, even then, the fermentation is always slight. The fundamental test is, however, the slide agglutination. All strains of dysentery bacilli gave complete agglutinations in dilutions of polyvalent stock antidysenteric serum as high as 1 : 50; the clumping occurring in the first five minutes.

P. H. M–B.

BOKU (Shyokun). **[On the Preparation of Dysentery Serum of Shiga Type for Diagnostic Purposes.]**—*Chosen Igakkwai Zasshi* (*Jl. Korean Med. Assoc.* 1923. Dec. No. 45. [Summarized in *Japan Med. World.* 1924. Feb. 15. Vol. 4. No. 2. p. 37.]

The immunization of the rabbit with Shiga's bacillus offers many points of difficulty, but the author has succeeded in obtaining a high titre agglutinating serum by immunizing the rabbit with cultures heated to 100° C. The serum thus produced contained no paragglutinins to any other varieties of dysentery bacilli and thus serves well for diagnostic purposes.

P. H. M-B.

TOKUYE (K.) & HATAI (K.). **The Distribution of the Dysentery Bacillus in Children affected with Dysentery.**—*Jl. Oriental Med.* Dairen. 1923. Nov. Vol. 1. No. 4. pp. 171–174.

The author describes an epidemic in Dairen. The dysentery bacillus was most frequently isolated on the first and second days of the disease. After the first week its frequency was greatly diminished. The abundance of the organism in the faeces does not always coincide with the gravity of the disease.

The Y bacillus was the most prevalent, the Flexner type was next; the original Shiga's bacillus, clinically the most severe, was relatively rare.

P. H. M–B.

FUNAIOLI (Giulio). **Un caso di dissenteria da bacillo di Shiga in un bambino di quattro mesi.**—*Gaz. d. Ospedali e d. Cliniche.* 1924. May 4. Vol. 45. No. 18. pp. 427–428. [10 refs.]

A child, 4 months old, who had been hand-fed after the first two months, but all of whose nutriment was boiled, was attacked by diarrhoea, passing stools at first green, later, frothy, mucoid and bloodstained. Dietetic measures produced no amelioration and on examination of the stool Shiga's bacillus was isolated and the serum agglutinated this organism in a titre of 1 : 100. 10 cc. of antiserum were administered but convulsions supervened and death occurred 3 weeks after the onset of the illness. It is believed that infection was conveyed by flies settling on the teat of the bottle or on the child's lips.

H. Harold Scott.

TINNEMEYER (W.). **Zur Behandlung der Bazillenruhr.**—*Med. Klin.* 1924. Apr. 6. Vol. 20. No. 14. pp. 450–451. [2 refs.]

Owing to economic conditions the serum treatment of bacillary dysentery cannot be undertaken in Germany at present on any large scale. In the last epidemic a new form of serum treatment was given to thirty patients—a polyvalent preparation, sold under the name of "Sentocym R.D.R.P." by Kalle & Co. (Biebrich). It causes a very considerable rise in the leucocytes and is said to exert a favourable influence on the disease. No exact details are given as to the method of its preparation, but it is given in two forms—intramuscular injection and tablets to be swallowed.

In chronic bacillary dysentery the author is in favour of operative interference. It is not that the lavage of the bowel is facilitated in this manner, but the fact that the large intestine is placed entirely at rest and the faecal stream diverted from the mucous surface. With the exception of one case the results were favourable. The bowel should be rejoined after a rest of 3–5 months.

P. H. M–B.

SUZUKI (T.), with TOKUYE (K.) & HATAI (K.). **The Treatment of Dysentery with Bakteriophage.**—*Jl. Oriental Med.* Dairen. 1923. Feb. Vol. 1. No. 1. pp. 36–38.

The following experiments were made in the treatment of bacillary dysentery with bacteriophage. This substance was first isolated from the faeces of children convalescent from dysentery. It proved to be very powerful and in a dilution of one in ten million was lethal, not only to the original bacillus, but also to allied varieties. From the original bacteriophage the toxic element was removed with charcoal, leaving behind a non-toxic bacteriophage. This substance was given [? injected] into the selected 19 cases of dysentery in children, and in 46 per cent. dysentery bacilli were isolated (out of 99 examinations). In 30 untreated cases the organisms were isolated in 57·7 per cent. From these figures the authors argue that the presence of active dysentery bacilli was decreased by 11·3 per cent. Of the treated cases one died; of the untreated, six. From the clinical results obtained the authors are confident in recommending this form of treatment, for they conclude that the dysentery bacilli disappear quicker than in the non-treated cases, the agglutinating power of the blood serum is higher, and the bacteriophage is present in higher proportion than in the non-treated series.

P. H. M-B.

POZERSKI (E.). **Sur l'excrétion de composés phosphorés par les bacilles de Shiga. Modification de cette propriété lorsque les microbes ont poussé sur un milieu partiellement déshydraté.**—*C. R. Soc. Biol.* 1924. Mar. 14. Vol. 90. No. 9. pp. 602–604. [3 refs.]

Shiga's bacilli when transferred to distilled water excrete phosphorus, the amount excreted being apparently dependent upon the vitality of the organisms. When grown on dehydrated or very dry medium the organisms develop special properties. When two agar cultures, normal and dry, were taken after inoculation and incubation with the organism, in the normal tube no trace of phosphorus could be detected after the slant has been washed fifteen times, but, on the other hand, the amount of phosphorus in the dry medium was found to be much greater. The bacilli, apparently, continue to excrete phosphorus till the organisms are no longer capable of multiplying on the medium. This property of the bacillus entirely disappears directly they are grown once more on normal agar. It is therefore dependent on the lack or presence of moisture.

P. H. M-B.

COURMONT & ROCHAIX (A.). **Variations " in vitro " de la fermentation des " sucres " par les bacilles du groupe dysentérique.**—*Jl. Physiol. et Path. Générale.* 1924. Apr. Vol. 22. No. 2. pp. 377–388. [42 refs.]

The conclusions reached are in the main comparable with those of much previous work on this subject.

By frequent subculture of the organisms on the same sugar media they come in time to acquire the power of splitting that particular carbohydrate. The four types of organism behave in different ways; the Flexner and Hiss bacilli resemble each other in the property they acquire of fermenting sorbite, glycogen, etc. One generation of organisms can be trained to ferment a sugar to which it is unaccustomed; this property lasts only for that generation and cannot, as a rule, be transmitted to the next; but there are certain exceptions to this rule. Thus Shiga's bacillus can be " trained " to ferment galactose after having previously been cultured up on glucose-medium. The facts collected have demonstrated the adaptability of the dysentery bacilli, and it is probable that the modifications produced *in vitro* are more limited than those which take place in external media and especially in the intestinal canal. It therefore stands to reason that no elaborate classification of the dysentery bacilli can be based upon their fermentation reactions. One cannot rely upon biochemical reactions alone, but must apportion due share to morphology and especially to serological reactions.

P. H. M-B.

BUSSON (Bruno) & OGATA (Norio). **Untersuchungen ueber sekundäre und bakteriophagenresistente Dysenteriestämme und ihre Beziehung zu den sogenannten Schmitzstämmen.** [Secondary and Bacteriophage-resistant Strains of Dysentery Bacilli and their Relation to the so-called Schmitz Strain.]—*Wien. Klin. Woch.* 1924. July 3. Vol. 37. No. 27. pp. 665–667.

In his original work d'HERELLE stated that under the influence of his bacteriophage it was possible to produce secondary races from the original Shiga strain, differing mainly in their power of fermenting certain sugars. The authors decided to repeat these experiments, using 11 strains of Shiga, 7 of type Y, 2 Strong, 11 Flexner, 4 Schmitz and 3 bacteriophages. By injecting rabbits with a mixture of original strains which had been acted upon in a typical manner by the bacteriophage agglutinating serums were prepared. The serums thus prepared were tested against the original and secondary strains. By these means it was shown that the secondary races of organisms were no longer agglutinated by the original serum. The authors believe that the secondary races are divisible into two types; those which permanently retain the newly acquired properties and those which do not.

The Schmitz bacilli could not be agglutinated by artificially produced immune serums. Under the influence of the bacteriophage certain Shiga bacilli acquired the property of producing indol.

P. H. M-B.

LEAGUE OF NATIONS. Health Organisation. **Reports on Serological Investigations presented to the 2nd International Conference on the Standardisation of Sera and Serological Tests held at the Pasteur Institute in Paris in November 1922.—IV. Anti-Dysentery Serum.**—pp. 78–168. [31 refs.]

Standardisation of Dysentery Serum. Report. [DOERR.] pp. 78–115.

The necessity of arriving at some international agreement on the problem of a uniform method of testing the potency of therapeutic dysentery sera is obvious.

The literature of the war contains a considerable number of reports which comment unfavourably on the results obtained by the serum treatment of bacillary dysentery. It has not been possible to form a correct judgment because the immense majority of the reports are valueless for the purposes of comparison. Excellent results have, however, been reported by so many reliable observers that it appears justifiable to conclude that this serum has a real therapeutic action, but we know very little of the conditions under which this capacity is developed to its utmost extent. The problem of standardization is by no means simple ; it is not merely the determination of the amount of antitoxin, or the amount of antibody which neutralizes the Shiga-Kruse toxin, but the *method* of titration of the antitoxic components which presents difficulties. The toxins of the Shiga-Kruse bacillus are of two kinds and have two corresponding antitoxins—*anti-exotoxin* and *anti-endotoxin*. It is possible to separate the two toxins by means of elective saturation, a procedure which is equivalent to the "*heat-separation*" process.

In the pathogenesis of dysentery symptoms in man the leading part is played by the enterotropic endotoxins, but possibly the remarkably specific action of these toxins upon the organs may be susceptible of a different explanation. There is not even agreement as to whether rabbits or white mice react more regularly to the toxins of the Shiga-Kruse bacilli ; or whether intraperitoneal or intravenous methods of injection should be adopted.

It must be decided whether the toxin or antitoxin is to be injected as a mixture or separately, for the results thus obtained are not comparable to those of titration of toxin-antitoxin mixtures *in vitro*.

It has been urged by KRAUS that antidysenteric sera should only be allowed to be sold if 0·1 cc. injected intravenously is able to neutralize a single fatal dose of the toxin. but this is the definition of a minimum standard and there are many objections to it.

The methods of FUKUHARA, based on EHRLICH's principles, are criticized, by which it appears that the dried antitoxin becomes modified into a non-toxic modification which does not possess neutralizing power; in other words, unlike the case of diphtheria toxin, the formation of *toxoids* does not take place.

The author considers the injection of serum based upon quantity rather than upon antitoxin content for clinical purposes is a source of danger, owing to the fixation of standard units without investigation

LEAGUE OF NATIONS. Health Organisation. **The Standardisation of Dysentery Serum.** First Report by SHIGA (Kiyoshi), KAWAMURA (H.) & TSUCHIYA (K.).—71 pp. With 15 charts. 1924. Geneva.

A series of experiments was carried out in order to determine a standard method of preparing a strong dysentery toxin. Toxin production is influenced by the duration of the culture ; the toxicity of the bouillon culture of the Shiga type of bacillus is highest in a two weeks' culture.

Toxin production is also influenced by the kind of peptone used in the medium ; these experiments show that Teruuchi's and fibrin peptones are somewhat superior to others, and that Chapoteaut's, as far as it could be tested, gave the best results.

Toxin production is also influenced by the reaction of the culture media ; the optimum alkalinity is pH 8·0 to 8·4 with an incubation period of from two to three weeks ; with less alkalinity the incubation period must be prolonged to obtain a given strength of toxin. When fresh grown in bouillon media the dysentery bacillus produces acid in two to three hours and the H-ion concentration increases to a maximum in six to seven hours ; at which it remains for one or two days and then decreases gradually to an alkalinity which at pH 8·6 remains steady for a long time. Unless it develops an alkalinity over pH 8·0 strong toxin cannot be obtained.

In the method of preparation of immune serum and determination of its efficiency test the most difficult point in estimating the lethal dose is the varying susceptibility of different animals. Some animals can stand three or four times the dose of others. As a whole the toxicity shows a decrease with storage. Far stronger toxin was obtained by autolysing organisms in suspension from agar culture than from bouillon culture. The use of toluol to kill the organisms yields strong toxins.

In determining the antitoxic effect of immune serum a certain amount of toxin (20 times the M.L.D. per kilogram of body weight of the rabbit) was mixed with varying amounts of the serum and incubated for half to one hour ; it was then injected intravenously to determine the amount of antitoxin which will just neutralize the toxin. Allowing for variations in the susceptibility of experimental animals and other sources of fallacy, it was found feasible to determine the maximum amount of immune serum which, when mixed with a certain amount of toxin, kills the great majority of the animals.

The amount of serum (L+) which when mixed with 20 times the M.L.D. of toxin kills the animal was taken as a unit. When the dysentery organism is used as antigen strong immunity is produced, whereas bouillon cultures or filtrates are much inferior in this respect. Sixteen horses were used for immunity work. Of six used for production of immunity with bacilli, four obtained a certain degree of immunity. The filtered toxins produced great emaciation and in three cases death. In the antitoxic tests of dysentery immune serum after exhaustive experiment it is concluded that the neutralization of dysentery toxin and antitoxin follows the law of multiplication to a certain degree, while the neutralizing value of dysentery toxin with immune serum runs parallel with the toxicity, and the method of determination of the efficacy of the immune serum with the M.L.D. of toxin gives fairly accurate results.

[This is a particularly difficult paper to summarize, as it necessarily consists of technical details, charts and protocols.]

P. H. M-B.

ZANGGER (R.). **Zur Wertbemessung der Antidysenteriesera.**—*Ztschr. f. Hyg. u. Infektionskr.* 1923. Vol. 101. No. 1. pp. 39–87. [42 refs.]

The author agrees with DOERR that in order to estimate the therapeutic value of anti-dysentery sera, it will be necessary to test monovalent sera on carefully selected human cases which have been diagnosed bacteriologically. With the knowledge so obtained one could then approach the question of a polyvalent serum. However, before this can be done it is necessary to have a reliable and standard laboratory method for the titration of anti-dysentery sera. The somewhat chaotic state in which this question is at present, as evinced by the variety of methods employed for the titration of these sera in the different serum institutes, has stimulated Zangger to investigate this question anew, in the hope of obtaining results which would pave the way to a more reliable and uniform method of titration.

Preparation and titration of dysentery toxin (Shiga).—The author worked with two types of toxin: (1) The filtrate from a 12 days' old broth culture; (2) a dry toxin prepared by Rowland's method (freezing and grinding bacilli with Na_2SO_4). He found these two toxins to be equally potent, giving rise to similar lesions in animals. The broth-filtrate toxin was found to be quite stable, showing little change when kept for one year under toluol in the cold (4° C.). Rabbits and mice are the best animals to employ and the intravenous route the one of choice for inoculation. The rabbit is more susceptible, and reacts more regularly to the toxin than the mouse. This difficulty, represented by the somewhat irregular reaction of animals to Shiga toxin, is well known and complicates the determination of the M.L.D. Zangger is only re-stating this difficulty when he says that the *dosis certe letalis* is more readily determined with accuracy than the *dosis letalis minima.* The principal point of interest in this section of the paper is the fact that Zangger can find no evidence in support of the division of Shiga toxin into an exotoxin (neurotoxin) and an endotoxin (enterotoxin). This conclusion of his is based on the similarity in action of the two toxins with which he worked.

Titration of Anti-sera.—Here there is little that is new. Two methods were employed: (1) Mixing the toxin and antiserum and allowing the two to act *in vitro* before inoculation; (2) inoculation of the two separately; toxin followed by anti-serum.

In both cases rabbits and white mice were employed. The author points out the necessity for fixing a definite time for the interaction of toxin and antitoxin before inoculation in method (1). Rabbits gave the most reliable results with this method, but for the sake of economy he suggests a gross titration on mice, followed by a more exact one on a small series of rabbits. For the second method the rabbit is unsuited, its susceptibility to the toxin being such that 30 *seconds* after the intravenous inoculation of 10 lethal doses of Shiga toxin, the injection of 67 times the *in vitro* neutralizing dose of serum was unable to prevent a fatal issue. The mouse, however, allows of greater latitude in this respect, it being possible to save the life of the animal even 6 hours after the injection of 10 lethal doses of toxin. Whether these two activities of the serum, neutralization *in vitro* and "curative" action *in vivo*, are due to one and the same factor (anti-toxin) the author is unable to say. This seems an important point and one which should be settled, because unless the serum possesses some activity other than its antitoxic power, the second and more difficult method of titration is without point.

S. Phillips Bedson.

ZDANSKY (E.) & HERZOG (B. M.). **Zur Wertbemessung der antitoxischen Dysenteriesera.**—*Ztschr. f. Hyg. u. Infektionskr.* 1924. May 28. Vol. 102. No. 3/4. pp. 352–371.

Ten batches of antidysenteric sera procured from different horses or from various specimens of venous blood from the same animal were tested; they had been prepared by various methods of producing immunity and stored for varying periods of time.

The method of titration was as follows:—

(*a*) Simultaneous equally-spaced intravenous injections into rabbits of 2½ times the lethal dose of toxin together with 0·2 to 0·4 cc. of serum.

(*b*) The intravenous injection of mixed toxin and antitoxin into white mice and rabbits.

(*c*) Intravenous injection at spaced intervals of 30 minutes of toxin and decreasing amounts of serum, white mice being employed.

The first series of experiments was conducted at the Serotherapeutic Institute in Vienna, the two last at Basle; and for this purpose a constant dose of Shiga-toxin was employed. Useful, but not always comparable, results were obtained in white mice from the toxin-antitoxin mixture.

The most exact method of estimating the potency of a serum is undoubtedly that of ZANGGER, which is based upon massive injections of serum into mice and subsequently into rabbits; experience having shown that a toxin mixture which is neutralized and harmless for mice is equally so for rabbits. The toxin should be a potent one and the test-dose for the mice one-tenth of that for rabbits.

P. H. M-B.

WILKINS (Lawson) & WELLS (H. S.). **Immunization of Children against Flexner Dysentery.**—*Jl. Amer. Med. Assoc.* 1924. May 17. Vol. 82. No. 20. pp. 1599–1601. With 1 fig. [17 refs.]

In the summer of 1923 a vaccine was employed in an outbreak of dysentery amongst children of ages ranging from 6 months to 8 years. Dysentery had been endemic during previous summers. Prior to the general adminstration of vaccine 10 typical cases had developed, besides cases of diarrhoea which could not be classed as dysentery. The vaccine was made from organisms of the Flexner type isolated from one of the patients. The organisms were killed by heat and three doses of 250, 500 and 1,000 million given subcutaneously at intervals of three days. Of 70 children inoculated only 2 had any general reaction; most had a slight local reaction consisting of an area of redness from 1–2 cm. in diameter at the site of inoculation. There was little induration. After vaccination had been performed the disease disappeared for more than two months. In the two months following the vaccination, 18 new children were admitted directly into the institution and none of them contracted the disease.

P. H. M-B.

HULL (Thomas G.) & HENKES (Kirby). **The Agglutination of the Flexner Dysentery Bacillus by Blood Serum of Tuberculous Persons.** —*Amer. Rev. Tuberculosis.* Baltimore. 1923. Nov. Vol. 8. No. 3. pp. 272–277. [2 refs.]

The authors have already drawn attention to the agglutination of *B. dysenteriae,* Flexner—but not of other members of the typhoid-dysentery group—that occurs in patients suffering from incipient tuberculosis. The dilution of serum was made either in the ordinary manner or by dissolving a drop of blood dried on filter paper, the actual test being performed by the microscopic method. Control tests of apparently normal and healthy individuals were almost all uniformly negative. Specimens from three patients in an advanced stage of tuberculosis were negative, but in 12 cases diagnosed as definitely tuberculous 9 (75 per cent.) were positive by the agglutination test. There appears to be a substance in the blood of many individuals, including persons in the incipient stages of tuberculosis, which causes an agglutination of the Flexner bacillus.

P. H. M-B.

UNCLASSED DYSENTERY.

ANDERSON (J.). "**Dysentery: Its Diagnosis and Treatment.**"—*British Guiana Med. Annual for 1923.* pp. 21–31.

The most striking feature of the Report of the Surgeon-General for British Guiana is the high rate of mortality and morbidity attributable to dysentery and allied intestinal disorders. These reports show that in 1919, 270 cases of dysentery were admitted to hospital in the big towns, with 57 deaths, while intestinal disorders in the whole colony were responsible for 1,050 deaths. The figures show that dysentery must take precedence of enteric as a serious factor in the depletion of the colony. Accuracy in the diagnosis of dysentery can never be obtained without the use of the microscope.

[The remainder of this paper is on familiar lines and is mainly based on the author's work already reviewed in this *Bulletin,* Vol. 19, p. 33.]

P. H. M-B.

FROEMSDORFF (Conrad). **Prognostische Bemerkungen ueber Ruhr.** [Remarks on Prognosis in Dysentery.]—*Arch. f. Verdauungskrankheiten.* Berlin. 1923. Dec. Vol. 32. No. 3/4. pp. 143–148. [11 refs.]

The author, impressed by the absence of reliable statistics on the prognosis of dysentery, gives figures on this subject obtained from German sources and extending over the period 1916–1920. In 1916 in a series of 12 cases the death-rate was 8·33 per cent.; in 1917 (109 cases) it was 29·35 per cent.; in 1918 (277 cases) 14·07 per cent.; in 1919 (68 cases) 8·82; and in 1920 (59 cases) 13·55 per cent. In some convalescence was very prolonged; others, after months of illness, made a permanent recovery. In the whole series of 525 cases, 415 recovered (79·04 per cent.), 22 were improved (4·19 per cent.), and 86 died (16·38 per cent.), and in 2 (0·38 per cent.) the condition remained unchanged. The death rate was high, especially so in elderly patients and in those who were greatly debilitated as a result of war privations, but the present is by no means an exceptional series, for in the industrial districts of Westphalia the death rate from this cause stood at 10 per cent. By following up the cases over a period of six years by means of enquiries it was possible to obtain answers from 210, although 3 had died in the meantime; in no case was the death attributable to dysentery. The following statistics were obtained. In 80·95 per cent. the cure had been permanent; 6·19 per cent. had suffered from slight relapses; several suffered from digestive disturbances and irregularities of the bowel; 11·42 had suffered from diarrhoea from time to time. In 3 a definite history of *chronic* dysentery was obtained; in 1·43 per cent. of this series therefore the disease became chronic.

P. H. M-B.

PADUA (Regino G.). [In English and Spanish.] **The Dysentery Problem in the Philippines. Epidemiology of a Recent Outbreak. La disenteria en Filipinas. Epidemiologia de una reciente epidemia.** —*Jl. Philippine Islands Med. Assoc.* 1924. Feb. Vol. 4. No. 2. In English, pp. 39–48. With 6 charts. [7 refs.] In Spanish, pp. 73–77.

The importance of dysentery as bearing on public health has hardly, as yet, been appreciated in the Philippines; only quite recently has an attempt been made to assign the deaths from dysentery to their respective types.

For the purpose of this paper the author has utilized all the available statistics for the last five years, which show that the death-rate from dysenteries was in that period twice that of cholera and four times that of typhoid fever—averaging 11·21 per 10,000 population in the whole archipelago. In other words, of 1,293,489 deaths from all causes during the past five years, about 57,634 were due to the dysenteries. The total death-rates from all causes have decreased in the period under review, but in Manila the mortality rates from dysentery decreased while those of typhoid increased. The death-rate from dysentery has not yet been reduced to a desired endemic limit, but the disease has become epidemic in various parts of the islands, especially during the rainy season. In Manila, when the deaths from dysentery are recorded by ages, it is found that for those under one year it is 7·06 per cent.; from 1 to 4 years, 47·74 per cent.; from 5 to 9 years, 19·51 per cent.; from 10 to 14 years, 3·14 per cent.; from 15 to 19 years, 1·76 per cent.; from 20 to 29 years, 4·63 per cent.; and 30 years and over, 16·15 per cent. The proportion of deaths from the dysenteries was relatively higher among younger children. The records frequently contain no information as to the etiology. The recent outbreak in Leyte Province was one of bacillary dysentery, although some cases of amoebic infection occurred synchronously. The spread of the infection was progressive from carriers and convalescents through polluted drinking water, flies and other insects. The prophylaxis is based upon general sanitary measures.

P. H. M-B.

HENRY (T. A.) & BROWN (H. C.). **Observations on Reputed Dysentery Remedies.**—*Trans. Roy. Soc. Trop. Med. & Hyg.* 1923. Dec. 13 & 1924. Jan. 17. Vol. 17. Nos. 6 & 7. pp. 378–385. [17 refs.]

Amongst the drugs used as native remedies are *Monsonia ovata* and *Rhynchosia adenodes* in South Africa and *Brucea abyssinica* and *B.*

sumatrana in Abyssinia and Malaya. The authors have exhaustively examined the bark of these species without finding any well-defined active substance. The materials removed by lead acetate by precipitation from these plant extracts are rich in tannin, the effect of which was tested on Glaucoma, an actively motile free-living ciliate. Ellagic acid, acer tannin, catechin and chebulinic acid were all found to be inert, and their lack of toxicity corresponded with their lack of real tanning properties. Kurchi bark tannin and ipecacuanha tannin were found to be highly toxic. The former, *Holarrhena antidysenterica*, is well known in India as a remedy for dysentery and its value is probably due to the alkaloid, conessine, which it contains. The accumulated evidence seems to show that such action as these substances have on Glaucoma is due to the tannins themselves and not to some adhering substance. The tannins were found to belong to three classes, (*a*) the crystalline, sparingly soluble tannins which are non-toxic, (*b*) the moderately toxic tannins, typified by gallo-tannin, and (*c*) the toxic tannins, of which the best example is that derived from sant or babool pods. These three classes do not correspond with the three classes into which they may be arranged chemically. The usual decomposition products of tannins, such as gallic acid, resorcinol and catechol, are slightly toxic to Glaucoma, but certain of the higher alkyl phenols, such as *iso*-amylphenol, are markedly toxic, and this is also true of the phenolic ether constituents of some essential oils, such as nutmeg, chenopodium and anethol (from anise oil), which have been used in amoebic dysentery.

P. H. M-B.

CAMPOS (E. de Souza). **Sur un cas de balantidiose suivie d'autopsie : colite, appendicite et lésions des ganglions lymphatiques.**—*C. R. Soc. Biol.* 1924. May 23. Vol. 90. No. 17. pp. 1341–1343.

The morbid anatomy of a fatal case of balantidiasis is here described. Small ulcerations were present in the large intestine. Histologically the necrosis extended to the upper layer of the submucosa, while the organisms were found to be numerous in the large intestine and appendix and throughout all the layers of the gut wall, not only throughout the connective tissue, but also filling the small blood vessels and lymphatics. In the necrotic areas they were found to have undergone degenerative changes. In the muscular fibres the parasites are surrounded by a clear space, while embolic masses were found embedded in the mesenteric glands.

P. H. M-B.

VON REHREN (Werner). **Beitrag zur Frage der Pathogenität der *Lamblia intestinalis* bei Erkrankungen der Gallenwege und Leber.**—*Klin. Woch.* 1924. June 10. Vol. 3. No. 24. p. 1079. [13 refs.]

A short record of the discovery of *Lamblia intestinalis* in the duodenal contents of a case of jaundice in a corpulent subject of 42 years. The parasites were active and extremely numerous. The duodenum was irrigated twice weekly with 10 per cent. magnesium sulphate solution, with consequent great diminution and ultimate disappearance of the parasites, together with the fever and jaundice. It is surmised that owing to the hypochlorhydria the parasites were able to pass through the stomach and gain a footing in the duodenum.

P. H. M-B.

KNIGHTON (J. E.). **Further Observation on the Treatment of** *Lamblia Intestinalis* **Infections.**—*Southern Med. Jl.* 1924. May. Vol. 17. No. 5. pp. 309–311.

The author returns to the subject of Lamblia infection with an account of four more cases, in which the history and symptoms were those of cholecystitis. *Giardia intestinalis* was very little in evidence in the faeces but was readily found in specimens of bile. Having previously tried all the usual remedies, including duodeno-biliary drainage, without lasting success, he now gave a trial to arsphenamin, and as a result he states that two or three intravenous injections of that drug (0·4 to 0·6 gm.) given at 7-day intervals will rid a patient of infection.

A. A.

HEGNER (Robert W.). **A Carnivorous Diet in the Treatment of Flagellate Diarrhea.** *Jl. Amer. Med. Assoc.* 1924. July 5. Vol. 83. No. 1. pp. 23–24. [3 refs.]

The object of this paper is to attract the attention of physicians to a reasonably argued novel method for treating intestinal troubles due to the presence of Protozoa.

Evidence exists that a carnivorous host is inauspicious to Giardia (Lamblia) and Trichomonas. Three rats, fed all their life on a carnivorous diet, were free from these flagellates, whereas their fellows fed largely on carbohydrates were abundantly infested with them; and of 15 rats fed on carnivorous diet for a week 7 per cent. lost all their Giardia and trichomonads and the other 93 per cent. lost, on an average, 90 per cent. of their Giardia and 98·2 per cent. of their trichomonads. Intestinal Protozoa, though often present in herbivorous mammals and not rare in omnivores, have very seldom been reported from carnivora; faex-examination of 12 carnivora of 10 species was negative, except in 1 case—a wild cat that had been fed on an omnivorous diet. It is suggested, therefore, that a carnivorous diet might be tried in the treatment of patients afflicted with intestinal Protozoa, or at any rate with diarrhoea due to Flagellata. A "carnivorous diet" includes fruit, toast, biscuits, butter, salad and pickles.

A. A.

DELANOË (P.). **De la fréquence des** *Trichomonas* **dans les selles diarrhéiques au Maroc.**—*Bull. Soc. Path. Exot.* 1924. Feb. 13. Vol. 17. No. 2. pp. 128–129. [3 refs.]

In Morocco Trichomonas must be included along with *Entamoeba histolytica* and *Balantidium coli* as a pathogenetic factor. In two cases within five months the author has found *T. intestinalis* in the stools in such numbers as to leave him in no doubt of their being the principal cause of an existing intestinal disorder.

A. A.

ANDERSON (Ch.). **Sur quelques entérites particulières présentées comme des dysenteries.**—*Bull. Soc. Path. Exot.* 1924. May 14. Vol. 17. No. 5. pp. 367–368. [1 ref.]

The author, referring to the paper of DELANOË (see p. 703), thinks that other parasites than Trichomonas are responsible for diarrhoeic conditions. Latterly he has found in such cases five instances of taeniasis, two of *Trichomonas intestinalis* and three of *Giardia intestinalis*.

P. H. M-B.

DEKESTER (M.) & MELNOTTE (P.). **Au sujet de la fréquence dans les selles diarrhéiques au Maroc des** *Trichomonas* **et autres protozoaires.**—*Bull. Soc. Path. Exot.* 1924. Apr. 9. Vol. 17. No. 4. pp. 301–302. [3 refs.]

In the faeces of 100 Arabs examined for intestinal flagellates the authors found Trichomonas in 6 per cent., as well as in 1·4 per cent. of hospital patients under treatment for enteritis of various kinds. They consider that *Giardia intestinalis, Trichomonas vaginalis* and *Tetramitus mesnili* are commensals of *Entamoeba histolytica*.

P. H. M-B.

KARKAREY (P. B.). *Ascaris lumbricoides* **and Severe Haemorrhage as Complications in a Case of Mixed Type of Dysentery.**—*Indian Med. Gaz.* 1924. Mar. Vol. 59. No. 3. pp. 141–142.

The symptoms of a severe case of mixed bacillary and amoebic dysentery were greatly relieved by the vomiting of ascaris and the passage per rectum, under santonin treatment, of a bundle of ten more. Altogether 32 were passed and the man completely recovered.

P. H. M-B.

PETRIE (A. A. W.). **The Diagnosis of Dysenteric Infections in Mental Hospitals.**—*Jl. Mental Science.* 1924. Jan. Vol. 70. No. 288. pp. 24–33. [11 refs.]

This is a well written account of dysentery compiled from a résumé of the recent literature.

P. H. M-B.

ERRATUM.

Vol. 21, No. 1, page 39, first line (CUNNINGHAM summary), for *microscopic* (examination of the stools) read *macroscopic*.

SPRUE.

Elders (C.). **Berust indische spruw op infectie, avitaminose of deficientie in ruimeren zin?** [Is Sprue caused by Infection, by Want of Vitamins or by Food Deficiency due to other Causes?]—*Geneesk. Gids.* 1924. Mar. 14. Vol. 1. No. 23. pp. 569–577. [4 refs.]

In a case of typical tropical sprue a bacillus was found in great quantities in the stools, resembling in all characters except one (more acid produced in cultures) **Ungermann**'s bacillus, said by **Beneke** to be the cause of the disease. This facultative aërobe is closely allied to *B. acidophilus* and differs from *B. bifidus* only in the latter being an obligatory aërobe. All these species come under the head of Beijerinck's genus *Lactobacillus,* more especially under those producing laevo-lactic-acid, characterized by the metachromatic granules in their protoplasm. The bacillus was found in several other sprue patients and also in various other patients living on milk. Change from a pure milk to a mixed diet caused its disappearance. It is concluded that it has nothing to do with the aetiology of sprue and may even be considered as favourable in so far as it prevents the growth of putrefactive organisms in the intestine. No Monilia were found, because of the milk diet. **Ashford**'s (former) theory that a Monilia is the cause of sprue is rejected, though it is conceded that it may cause secondary infections in the weakened organism.

Since 1916 the author has in this way arrived at the conclusion that sprue is a deficiency disease. Further clinical experience, showing that a diet of milk and fruit, although yielding favourable results, does not prevent relapses, has brought him to prescribe a mixed diet, composed of meat (principally beefsteak), milk, oranges, strawberries, yolk of eggs, cod liver oil and limewater. Later on the juice from vegetables, still later peas and beans, are added. Carbohydrates are avoided. In a practice of almost 10 years no patient has died under this treatment.

N. H. Swellengrebel.

Manson-Bahr (Philip). **The Morbid Anatomy and Pathology of Sprue, and their Bearing upon Aetiology.**—*Lancet.* 1924. June 7. pp. 1148–1151. With 2 figs. [16 refs.]

The author notes three points about sprue which may have a bearing on its aetiology—its reputed absence from Tropical Africa, its preference for the European, the resemblance which some cases of pernicious anaemia bear to it. The pathological appearances are not informative except in the case of autopsies on early and rapidly fatal cases; and evidence is accumulating that the essential primary lesion is ulceration of the small intestine, particularly the lower end of the ileum, either superficial or deep; in the last event death may follow from perforation. **Justi** and **Fischer** and **von Hecker** have published autopsies in which ulceration of the small gut was found [see this *Bulletin,* Vol. 4, p. 10; Vol. 19, p. 788].

The author describes two rapidly fatal cases and the investigations made upon them. In one, of about ten months' duration, death occurred from general peritonitis. There was found " one large ulcer in the ileum six feet from the ileocaecal valve . . . opposite the mesenteric attachment. It measured one inch in diameter and had perforated in two places." The other case was of about the same duration and peritonitis again closed the scene.

At autopsy "the main interest centred in the ileum. The mucous membrane was acutely inflamed, with diaphanous transparent patches. Twelve ulcers of varying sizes, situated on the surface opposite the peritoneal attachment, were found, separated from each other at regular intervals of about 9 inches. The greatest number of ulcers was found in a length of gut about 4½ feet. These ulcers were more or less of the same size, roughly oval in shape, with puckered, rolled margins, and haemorrhagic bases. When held up to the light they were found to be translucent, and in all of them actual perforation of the bowel had occurred. In size they varied from 0·5 to 1 cm. The ulcers had no relation apparently to Peyer's patches, which were normal in appearance. . . . In the upper part of the jejunum one small ragged ulcer, 3 mm. in diameter and similar to those already described, was present."

Histologically there was general atrophy of the villi, a diffuse round-cell infiltration of the whole of the mucosa, general fibrosis of the submucosa, and dilatation of the capillary vessels. In the tissues underlying the ulcers were numerous granular masses of a yellowish brown pigment (haemofuscin). Lesions of the tongue, liver and spleen are described; pancreas, kidney and large intestine were healthy, or nearly so.

Discussing the pathological lesions in relation to the clinical phenomena the author notes that the bulk of the faeces may be accounted for by the large amount of non-absorbed fat in them; recent analyses suggest that this fat is already digested but fails to become absorbed through the villi owing to their destruction or to chronic inflammation evidenced by the widespread round-celled infiltration throughout the mucosa. If this view is correct, symptoms similar to those of sprue should be seen in other diseases invading the mucous membrane of the ileum, and such a case is cited in which a malignant growth of the ileum was present. The anaemia may be slight, or well marked in long-standing cases, even resembling that of pernicious anaemia. The haemolysis is, in the author's opinion, consequent upon the ulceration of the small gut, and there is evidence for this in the blood pigment within the phagocytes at the base of the ulcers, and in the ferrocyanide reaction in the liver, which was intense in the author's two cases.

No fungi were found in these cases, though cultures were made from all the organs as well as the intestine. The author regards yeasts, considered by some to be responsible for the specific lesions of sprue, as secondary invaders such as may appear in any prolonged wasting disease. He quotes McCarrison's work on monkeys, but finds no evidence that the lack of vitamins plays any part in the production of sprue, at any rate in Europeans in the East.

A. G. B.

Van Dooren (Th. P. C.). **Beschouwingen over Indische Spruw.** [Ideas concerning Tropical Sprue.]—*Geneesk. Tijdschr. v. Nederl.-Indië.* 1924. Vol. 64. No. 1. pp. 28–47. With 1 plate.

A clinical account of this disease, containing much speculation as to the etiology of sprue and few novel features. The author states that sprue is generally marked by irritation symptoms at the onset and by

symptoms of a depressive character in the later stages. Not generally known is the use of pituitrin injections against the abdominal distension caused by colonic atony.

W. J. Bais.

HINES (Laurence E.). **Studies on the Identification of** *Monilia Psilosis.*—*Jl. Infect. Dis.* 1924. May. Vol. 34. No. 5. pp. 529–535. [6 refs.]

Having recovered from the faeces of a sprue patient a yeast which exhibited the characters of *Monilia psilosis*, the author compared it with strains of fungi isolated from other stools and with other known blastomycetes. After full investigation he concluded that the morphologic and biochemical reactions of *M. psilosis* are not sufficiently distinctive to form a basis of separation from other yeasts and that common agglutinins for yeasts from various sources are readily produced in rabbits by injecting various strains of blastomycetes. Mycotic abscesses were consistently produced in animals by injecting them with old cultures of *M. psilosis.*

The evidence, as a whole, does not point to *M. psilosis* as constituting a well-defined species.

P. H. Manson-Bahr.

ROSENFELD (A. S.). [**Tropical Sprue; Necropsy.**]—*Northwest Medicine.* Seattle. 1924. Apr. Vol. 23. p. 181. [Summarized in *Jl. Amer. Med. Assoc.* 1924. May 24. Vol. 82. No. 21. p. 1732.]

Tetany occurred during the last few months of illness, when calcium lactate was given by the mouth with some relief, but later haemorrhages occurred from various orifices of the body. It is suggested that in all sprue cases therapy should be supplemented by the administration of calcium either by the mouth or intravenously.

P. H. M-B.

BAGCHI (Harendra Nath). **A Case of Sprue?**—*Calcutta Med. Jl.* 1924. Feb. Vol. 18. No. 8. pp. 619–622.

An account of a straightforward case in a native lady of Bengal, laying special stress upon the differential diagnosis of the disease.

P. H. M-B.

RABIES: A REVIEW OF RECENT ARTICLES.

The nature of the virus of rabies is a topic which has been under discussion since the time of OVID, and regarding which, as would appear from a review of the current literature, the last word has not yet been spoken. The virus is definitely infective, and in the animal host at least is capable of multiplication. In the active form in which it exists in the saliva it is a body of very small dimensions. It can pass through a porcelain bougie, and it is claimed also that it can pass through a collodion sac (LEVADITI and NICOLAU, *C. R. de l'Acad. des Sc.* 1923, Vol. 176, p. 717). It is in some manner related to the Negri body. This body according to some writers is a product of degeneration brought about by the action of the virus, and according to others is a definite phase in the life cycle of the germ of rabies. Some consider that the occurrence of Negri bodies is not absolutely specific of the presence of the germ of rabies. It is not to be wondered at that a proof of specificity resting on purely morphological grounds breaks down, but on the other hand there can be no doubt that the degree of correlation between the presence of Negri bodies on the one hand and of rabies on the other is of a very high order, and sufficient for diagnostic purposes. It is also claimed that the virus multiplies in ascitic fluid in the presence of rabbit kidney, in horse serum and citrated rabbit plasma, reproducing ultra-microscopic forms to the fourth passage. It would thus appear that the germ in a certain phase is a body of molecular dimensions, which under certain circumstances and in vitro can reproduce itself in this phase.

The criteria of "life" in its simplest form are the capacities of assimilation and of multiplication by fission. The first is essential, the second is usual but not absolutely essential. In more exact terms a system may be said to be living if it has the power of catalysing the formation of systems similar in constitution to itself from more elementary compounds. In this connexion one is reminded of Brailsford ROBERTSON'S theory of growth as a process of autocatalysis. If the dimensions of the living individual are of so small an order that it is able to pass through a collodion sac, that is to say, if the living unit is smaller than an albumen molecule, but larger than a molecule of peptone, or of an amino acid, one is led into interesting speculations.

Let us in the first place follow the recent work of those who believed the germ to be a protozoon of the type of the microsporidia.

LEVADITI (1, 2, 3, 4) and his co-workers describe a life cycle in which the Negri body takes its place as a pansporoblast, which is formed only in neurones which are physiologically and morphologically healthy. Where degeneration has occurred no pansporoblasts are found. The pansporoblasts contain "plages," each of which is an aggregate of microsporidium spores, and round them the neurone of the host secretes a hyaline substance which forms a capsule, isolating the colony from

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1–4. **LEVADITI (C.), NICOLAU (S.) & SCHOEN (R.).** La microsporidiose du lapin ; ses relations avec la rage.—*C.R. Acad. Sci.* 1924. Jan. 7. Vol. 178. No. 2. pp. 256–258. [4 refs.] ; La nature microsporidienne du virus rabique. —*C.R. Soc. Biol.* 1924. Feb. 22. Vol. 90. No. 6. pp. 398–402. [4 refs.] ; La nature du virus rabique.—*Ibid.* Apr. 18. Vol. 90. No. 14. pp. 994–997. [1 ref.] ; La nature du virus rabique fixe.—*Ibid.* June 20. Vol. 91. No. 21. pp. 56–58. [1 ref.]

the rest of the cell. This pansporoblastic phase appears in the affected animal before symptoms have appeared, the clinical signs of the disease being ascribed to the action of the discrete germ. They consider also that the germ behaves differently in different regions, the pansporoblastic stage depending upon not only the physiological integrity of the neurone, but also upon its embryological character, and further, that the absence of the Negri bodies in fixed virus rabies may be accounted for by the fact that the rate of multiplication of ultramicroscopic forms is so rapid that the animal dies before cystic forms have developed. They suggest that the parasite be called *Glugea lyssa*.

An attempt to revert to the formation of Negri bodies by successively subpassaging fixed virus through the brains of three monkeys (the last of which was a chimpanzee) failed. The authors note that the virulence of this virus, which had been fixed by intracranial subpassage through rabbits, was retained, the chimpanzee dying after an incubation period of eight days. They seem to have overlooked the fact that rabies virus can be fixed in the rabbit, or the dog, or the monkey (macacus), provided that it is introduced intracerebrally. Fixed virus is no doubt a mutation of street virus, but the mutation is not occasioned by the species of the animal concerned so much as by the nature of the tissue upon which it is implanted.

MANOUELIAN and VIALA (5, 6) describe the active phase as consisting of elongated fusiform or piriform bodies averaging 1 to 2μ in length, but frequently smaller, and just at the limit of visibility. These they claim are found in all forms of rabies and in all virulent organs. They are found in the salivary glands, and stain similarly to protozoa. They are always intracellular. They consider that Negri body formation is due to the degeneration of these intracellular forms, and is brought about by their agglutination into masses which ultimately coalesce. MANOUELIAN applies the name *Encephalitozoon rabiei* to these bodies.

VOMELA (7) summarizes the views of those who hold that Negri bodies are reaction-products of the nerve cells against the virus. The total absence of Negri bodies in certain cases of rabies; their presence in some parts and absence from other parts of the nervous system though each are definitely infective; the proved ultramicroscopic nature of the virus; and the fact that the size of the body depends largely upon the size of the animal affected, have led him to this conclusion.

It is quite obvious that from all this nothing has been proved. Morphological methods must break down when applied to structures which are beyond or just bordering upon the limit of visibility. This applies to the upholders of either view, for even as it is impossible to prove the existence of structure under these conditions, so also is it impossible to make a definite statement to the contrary.

Attention has been directed by REMLINGER to variations of virulence of fixed virus as a result of long continued subpassage. The original strain of fixed virus is now in about its 2,000th passage. REMLINGER

5, 6. MANOUELIAN (Y.) & VIALA (J.). *Encephalitozoon rabiei* parasite de la rage. —*C.R. Acad. Sci.* 1924. Jan. 14. Vol. 178. No. 3. pp. 344–345. [1 ref.]; *Ann. Inst. Pasteur.* 1924. Mar. Vol. 38. No. 3. pp. 258–267 With 4 plates. [9 refs.]

7. VOMELA (Stanislav). Das Centralnervensystem bei der Lyssa.—*Bibliothèqu Microbiol. Tchéco-Slovaque.* 1923. T. 4. 18 pp. [19 refs.]

(8, 9, 10, 11) claims that marked changes have occurred in its properties. It has become inoffensive to man, and it has also become less resistant to desiccation and to the action of glycerine. He is of opinion that a cord which has been dried for 3–4 days at the 2,000th passage corresponds to one which was dried 6-7 days in early Pasteurian times. LE FÈVRE DE ARRIC and TCHANG KOUO-NGEN (12) criticize these generalizations. They compare the strain in use in Brussels, which emanated from Paris ten years previously, with the strain at present employed in Paris, and between these they demonstrate considerable differences. The Brussels strain is in general the more virulent. They rightly conclude that the differences which are observed depend upon the treatment which the virus has received in the different institutes. This is well known to rabies workers, and is a statistical necessity. It has been shown, for example, that continued selection for subpassage of brains of animals which have died of rabies with incubation periods of less than average duration tends to shorten the incubation period of the strain.

In connexion with the experiments cited above REMLINGER proposes the use of glycerine attenuation in place of desiccation in the preparation of material for antirabic inoculation. He points out that when brain material is placed in glycerine the loss of virulence proceeds centripetally, and that consequently the virus remains alive for a longer period of time in those portions of brain which have the greatest radius. Thus the effect of glycerine is very similar to that of desiccation, for it was pointed out by HARVEY and MCKENDRICK that in cords which are dried in an exsiccator the process also proceeds centripetally, the loss of virulence agreeing almost exactly with the loss of weight resulting from the abstraction of water. The use of the term attenuation in this sense is somewhat unfortunate. The process is analogous to that of disinfection, and it has still to be shown that those organisms which survive the action of disinfectants over unusually long periods of time (*vide* the work of Harriette CHICK) have been modified by the disinfectant. The phenomenon proceeds according to the law of mass action, that is to say it depends upon the chances of occurrence of collisions. The conception of attenuation depends upon our definition of virulence—and the virulence of invisible filtrable virus depends upon such unknown factors as its concentration, its rate of multiplication, and finally upon the specific aggressiveness of the individual germ. RODET (13) and ROCHAIX (14) follow REMLINGER

8–11. REMLINGER (P.). Contribution à l'étude de l'action de la glycérine sur le virus rabique.—*C.R. Soc. Biol.* 1924. Jan. 25. Vol. 90. No. 2. pp. 70–72; Une nouvelle méthode de traitement antirabique. Les moelles glycérinées fraîches.—*Ibid.* 1924. Feb. 8. Vol. 90. No. 4. pp. 272–273; Sur quelques modifications susceptibles d'être apportées au traitement antirabique.—*Bull. Acad. Med.* 1924. Feb. 5. Year 88. 3rd Ser. Vol. 91. No. 6. pp. 199–204. [6 refs.]; *Arch. Inst. Pasteur de Tunis.* 1924. Apr. Vol. 13. No. 1. pp. 114–119. [6 refs.]

12. LE FÈVRE DE ARRIC (M.) & TCHANG KOUO-NGEN (J.). Activité comparée du virus rabique fixe entretenu à Paris et à Bruxelles.—*C.R. Soc. Biol.* 1924. Apr. 11. Vol. 90. No. 13. pp. 980–982. [5 refs.]

13. RODET (A.). A propos de l'action de la glycérine sur le virus rabique.—*C.R. Soc. Biol.* 1924. May 16. Vol. 90. No. 16. pp. 1259–1262. [4 refs.]

14. ROCHAIX (A.). L'atténuation du virus fixe par la glycérine et le moyen pratique de l'eviter.—*Ibid.* 1923. Dec. 22. Vol. 89. No. 37. pp. 1309–1310. [1 ref.]

in studying the effects of glycerine. **Gonsalves** (15) suggests the use of purified olive oil as a preservative, but **Remlinger** (16) replies that it has no disinfectant properties.

All these methods are put forward with the object of simplifying the usual Pasteurian technique, and it is satisfactory at this date to know that those who still use it have realized its many disadvantages. Thus **Marie** of Paris writes to **Fermi** of Sassari (17): "I am convinced as you are, of the necessity of simplifying the procedure of Pasteur . . . I believe that the method of carbolized virus is equally simple and offers many advantages, as would appear from work published and results obtained."

We turn then naturally and with some relief from the above to the consideration of a rabies vaccine prepared according to the ordinary methods in use in vaccine therapy. We shall not discuss in detail the long and acrid controversy (17) which is being waged between **Fermi** and **Puntoni** regarding the use of carbolized virus. It is admitted by all that, even as in the case of other vaccines, a living vaccine has greater immunizing properties than one which has been killed. Disinfection by weak solutions of carbolic acid is a slow process, and at different stages in the process there will be different numbers of survivors. One may with **Semple** use a virus in which there are no survivors, or with **Puntoni** (18) commence with dead, and pass on to emulsions in which there are some survivors. The principles involved are the same, and are in accordance with ordinary practice. Whether living or dead then—and if the dead suffice, then there can be no argument in favour of the living—the method of antirabic inoculation seems at last to be settling on to the simple foundations of the technique of ordinary vaccine therapy.

Carbolized virus is used in Sardinia, throughout India, in Mesopotamia, in Japan, and in Rome.

When the number of patients becomes large the method of **Pasteur** becomes impracticable. On the other hand, the consumption of rabbits and the work entailed in the treatment of dried cords becomes too great; on the other, the number of "accidents paralytiques' becomes too obtrusive.

Simon (quoted by **Hetsch**) (19) collected information regarding 211,779 persons who had, during the years 1888–1911, undergone treatment by emulsions of dried cords. Of these eighty-four, or 0·48 per thousand, suffered from paralytic accidents. **Remlinger** (1905) (quoted by **Harvey** and **Acton**, *Indian Journal of Medical Research,*

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15. **Gonsalves** (N. Botafogo). Lipovaccination antirabique. Conservation du virus rabique dans l'huile d'olive.—*C.R. Soc. Biol.* 1924. Apr. 4. Vol. 90. No. 12. pp. 876–877. [1 ref.]

16. **Remlinger** (P.). L'huile d'olives peut-elle remplacer la glycérine pour la conservation du virus rabique.—*C.R. Soc. Biol.* 1924. June 20. Vol 91. No. 21. pp. 59–61. [3 refs.]

17. **Fermi** (Claudio). Diagnosi biologica della rabbia—Autovaccinazione da virus di strada—Metodo di vaccinazione e di sierovaccinazione. (Replica alla risposta del Prof. V. Puntoni pubblicata negli " Annali d'Igiene." 1923. No. 12.)—*Ann. d'Igiene.* 1924. Feb. Vol. 34. No. 2. pp. 115–122. [3 refs.]
    Puntoni (Vittorio). Risposta al Prof. Fermi.—*Ibid.* p. 123. [1 ref.]

18. **Puntoni** (Vittorio). Moderna organizzazione di un Istituto antirabico. L'Istituto antirabico di Roma durante l'ultimo quinquennio.—*Policlinico.* Sez. Prat. 1924. Apr. 14. Vol. 31. No. 15. pp. 482–484. [7 refs.]

19. **Hetsch** (H.). Die Lyssainfektion und ihre Behandlung.—*Med. Klin.* 1924. Jan. 27. Vol. 20. No. 4. pp. 103–107. [1 ref.]

1923, Vol. X, p 1038) reported forty cases out of a total of 107,712 persons treated (or 0·37 per thousand). No such accidents occur after treatment according to the method Högyes or by carbolized virus (Kasauli, no cases in 47,420).

In the Pasteur Institute at Kasauli 7,506 patients were treated in the year 1920. At the above rate this would entail about three such accidents a year. The reviewer may say from personal experience that neither the nerves nor the reputation of a director could bear such a strain as this. Strain is measured not by percentages but by actual numbers.

A useful modification of antirabic vaccine arises from the application of the method of freezing followed by quick desiccation (SWIFT, *Journal of Exper. Medicine* 1921, Vol. 33, 1). KIRSCHNER (20) describes a modification of SWIFT'S apparatus, and claims that after such treatment fixed virus preserves its virulence for sixteen months.

GEDROYC (21) has investigated the action of the lymph of the insect *Deilephila euphorbiae* upon rabies virus and shown that it destroys the parasite in twenty-four hours in vivo.

ARLOING and THÉVENOT (22), following up their investigations on the protective action of proteid and anaphylactic "shock" on tetanus toxin, have turned their attention to rabies. They claim that in the guineapig the gravity of the infection is diminished and the course delayed by such treatment. Their results showed that anaphylactic shock was more effective than protein shock, and that casein peptone was more potent than either horse-serum or muscle-peptone. Experiments on rabbits resulted in complete failure. They ascribe this to the extreme sensitiveness of the rabbit to the fixed virus (rabbit) with which the tests were carried out, and to the feebler reaction of the rabbit as compared with the guineapig to shock of either sort. REMLINGER and BEL (23) have shown that urotropin has no effect upon street virus rabies in guineapigs.

With regard to the clinical aspects of the disease, CHAKRAVERTI (24) describes a case with an incubation period of seven months, and ALBERTYN (25) discusses the diagnosis of probable rabies in a person bitten by a "meerkat." BABÉS and JONESCO (26) draw attention to

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20. KIRSCHNER (L.). Over het verduurzamen van Bacterien en van het Rabies-Virus-fixe. [On the Preservation of Bacteria and of Rabies-Virus-Fixe.]—*Geneesk. Tijdschr. v. Nederl.-Indie.* 1924. Vol. 64. No. 2. pp. 193–204. With 1 text fig. [38 refs.]

21. DE GEDROYC (Michal). L'influence de la lymphe des insectes sur le microbe de la rage.—*C.R. Soc. Biol.* 1924. Apr. 4. Vol. 90. No. 12. pp. 906–907.

22. ARLOING (Fernand) & THÉVENOT (Lucien). Essais sur l'action prevéntive et curative des chocs protéiques et anaphylactiques dans la rage expérimentale.—*Bull. Acad. Med.* 1924. June 10. Year 88. 3rd Ser. Vol. 91. No. 24. pp. 733–736. [2 refs.]

23. REMLINGER (P.) & BEL (P.). Inefficacité de l'urotropine comme médicament préventif ou curatif de la rage.—*C.R. Soc. Biol.* 1924. May 23. Vol. 90. No. 17. p. 1312.

24. CHAKRAVERTI (Amulyaratan). A Case of Hydrophobia with unusually Long Incubation Period.—*Calcutta Med. Jl.* 1924. Feb. Vol. 18. No. 8. pp. 622–623.

25. ALBERTYN (C. J.). Rabies?—*S. African Med. Rec.* 1924. Mar. 8. Vol. 22. No. 5. pp. 98–100.

26. BABÉS (V.) & JONESCO (Démètre). Un cas d'hémianesthésie rabique ascendante.—*C.R. Soc. Biol.* 1924. Jan. 25. Vol. 90. No. 2. pp. 144–145.

a case in which symptoms of rabies were preceded by hemianaesthesia. As this case interrupted a long series of successes, and on account of the peculiar clinical picture, they conclude that there is evidence in this instance of a variety of parasite or of toxin which is not influenced by their method of treatment.

With regard to the curability of rabies attention must be directed to an important paper by Rigney D'AUNOY (27). He inoculated six rabbits, each with 500 minimum infective doses of fixed virus. Of these five showed symptoms on the seventh day, three dying on the eighth and two on the ninth. The history of the sixth rabbit is as follows :—It became sick on the seventh day and paralysed in the hind quarters on the eleventh day, on the fifteenth it remained lying down, on the sixteenth it began to improve, and on the seventeenth it could stand up, but was very unsteady. From the nineteenth recovery was rapid, until the twenty-fifth it appeared to be in normal health.

On the sixteenth day when improvement began D'AUNOY drew off some saliva, and injected it into two other rabbits. These developed rabies, the diagnosis being confirmed both by the presence of Negri bodies and by further animal experiments. Saliva was again drawn off on the fortieth day, and injected into two rabbits ; these did not develop rabies, though they were susceptible, as was proved by the fact that they succumbed to a further injection of one minimum infective dose of fixed virus.

On the fortieth day this remarkable animal received 1,000 minimum infective doses of fixed virus subdurably, as also did two controls. The controls died, but the test animal escaped.

Before leaving the subject of animal experiment we may refer to papers by ROCHAIX and PAPACOSTAS (28), who confirm the fact that the mucous membrane of the intestine is impermeable to the virus ; by ISABOLINSKY (29), who points out that contaminations of cords taken for the purpose of treatment from rabbits are probably of external origin ; by UTENKOW (30), describing a method of intracerebral inoculation through the protuberantia occipita externa ; and by FIGUEIRA (31), upholding the value of guineapigs as experimental animals for diagnostic purposes.

CERUTTI (32) reports cases of canine rabies from German East Africa and CHASSIGNEUX (33) from Dakar.

27. D'AUNOY (Rigney). Spontaneous Recovery of Rabbit from Experimental Rabies.—*Jl. Infect. Dis.* 1924. Apr. Vol. 34. No. 4. pp. 425-427. [7 refs.]
28. ROCHAIX (A.) & PAPACOSTAS (G.). Sur l'imperméabilité de la paroi intestinale pour le virus rabique.—*C.R. Soc. Biol.* 1923. Dec. 22. Vol. 89. No. 37. p. 1308. [1 ref.]
29. ISABOLINSKY (M.). Ueber die Sterilität des Virus fixe.—*Cent. f. Bakt.* 1 Abt. Orig. 1924. Mar. 25. Vol. 91. No. 6. pp. 396-398.
30. UTENKOW (M. D.). Eine neue intrazerebrale Methode der Impfung des Tollwutvirus.—*Cent. f. Bakt.* 1 Abt. Orig. 1924. Apr. 30. Vol. 91. No. 7/8. pp. 490-492 With 1 fig.
31. FIGUEIRA (L.). Le cobaye et le diagnostic biologique de la rage.—*C.R. Soc. Biol.* 1924. Mar. 7. Vol. 90. No. 8. pp. 584-585. [1 ref.]
32. CERRUTI (G.). Sur plusieurs cas de rage constatés en Afrique Centrale (Urundi).—*Ann. Soc. Belge de Méd. Trop.* Brussels. 1924. Jan. Vol. 3. No. 3. pp. 213-221.
33. CHASSIGNEUX (André). A propos de quelques symptômes rabiformes observés chez des chiens à Dakar.—*Bull. Soc. Path. Exot.* 1924. Apr. 9. Vol. 17. No. 4. pp. 325-326.

Some interesting facts regarding the bites of herbivora are detailed by OUCHAKOFF (34) from Russia. During the period 1902–1914 the registers from all the Russian antirabic stations show 2,859 persons as having been bitten by rabid horses and 3,522 by rabid cows. One of the former group succumbed, and none of the second. It is usually held that rabies cannot be conveyed by the bites of rabid herbivora, but statistics of any magnitude have been difficult to obtain. The value of the Russian figures is that they set an upper limit to the chance of infection. If it exists at all it is less than one-sixtieth per cent.

A. G. McKendrick.

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34. OUCHAKOFF (V. G.). Les morsures par les herbivores.—*Arch. Biological Sciences*. Petrograd. 1923. Vol. 23. No. 1–3. In Russian. pp. 59–62. [9 refs.] French summary p. 231.

ARCHIVES DE L'INSTITUT PASTEUR DE TUNIS. 1924. Apr. Vol. 13. No. 1. pp. 138–153.—**Fonctionnement des services de l'Institut Pasteur de Tunis pendant l'année 1923.**

CEYLON. Administration Reports. **Report of the Director, Government Pasteur and Bacteriological Institutes, for the Year 1922.** [NICHOLLS (Lucius) Director.]—8 pp.

DOLBEY (Robert V.) & ABDULLAH EL KATIB. **Hydrophobia in Egypt.**—*Lancet*. 1924. Mar. 15. pp. 538–540.

HAJEK (K.). **[Nervous Disturbances after Hydrophobia Vaccination.]**—*Zentralb. f. innere Med.* Leipzig. 1924. May 3. Vol. 45. p. 344.

MIKHAILOF (A.). **La rage et son traitement en Bulgarie.**—*Jl. Physiol. et de Path. Gen.* 1924. Jan. Year 23. Vol. 22. No. 1. pp. 79–82.

ROCHAIX (A.). **Le traitement antirabique dans la région Lyonnaise. (1922.)** —*Jl. de Physiol. et de Path. Gén.* 1923. Year 22. Vol. 21. No. 4. pp. 722–724.

SZYMANOWSKI (Z.) & SIENCZEWSKI (St.). **Contribution à l'étude de l'immunisation des chiens contre la rage.**—*C.R. Soc. Biol.* 1924. Mar. 21. Vol. 90. No. 10. pp. 697–699.

TCHESCHKOFF (A. M.). **La rage dans ses rapports avec la situation alimentaire de Petrograd.**—*Arch. Biological Sciences*. Petrograd. 1923. Vol. 23. No. 1–3. In Russian. pp. 63–69. French summary pp. 232–233.

KALA AZAR.

HANCE (J. B.). **The Geographical Distribution of Kala-Azar.**—*Indian Med. Gaz.* 1924. Feb. Vol. 59. No. 2. pp. 82. [4 refs.]

It is generally believed that kala azar does not occur in the North-West Frontier Province of India. In a number of cases of enlargement of the spleen with irregular fever in the hospital at Dera Ismail Khan the aldehyde reaction gave a positive result. Puncture of the spleen, however, failed to yield Leishmania until recently, when they were discovered in two cases in natives who were born near Kohat and who had never been out of the Province. It is thus evident that the ideas on the geographical distribution of the disease require revision.

C. M. Wenyon.

GANGULI (P.). **Investigations on the Etiology and Treatment of Kala-Azar and some other Common Diseases in Bengal.**—*Indian Med. Rec.* 1924. Feb. Vol. 43. No. 2. pp. 34–36.

From a study of 75 cases of kala azar a number of points of interest came to light. The formol-gel test is more reliable than the globulin precipitate test. The gelification does not as a rule take longer than 20 minutes to occur. It was positive in three minutes in a mild case of splenomedullary leukaemia. Blood serum of early kala azar cases was free from bile ; if present in cases of less than five months' history it was usually due to malaria. Nearly every case of kala azar gave the test for occult blood in the faeces, a fact which the author considers sufficient to account for the anaemia. The specific gravity of the blood in 23 cases examined was below 1,053. In the treatment of cases it was found that if the solution of sodium antimony tartrate was autoclaved before use the febrile reaction which followed the injection of solutions which had been sterilized by boiling could be avoided.

C. M. W.

BASU (Sudhir Chandra). **Age Incidence of Kala Azar Patients.**—*Indian Med. Rec.* 1924. Apr. Vol. 43. No. 4. pp. 107–108. With 1 chart in text.

Of a series of 1,599 cases of kala azar in Bengal, regarded as such because the blood examination was negative for malaria and because they responded to treatment with tartar emetic, 8 per cent. were below 5 years of age, 29 per cent. between 5 and 10, 23 per cent. between 10 and 15, 17 per cent. between 15 and 20, 14 per cent. between 20 and 30, 7 per cent. between 30 and 40, and 2 per cent. over 40.

C. M. W.

BANERJEE (Dhirendra Nath). **The Latent Phase of Kala-Azar.**—*Calcutta Med. Jl.* 1924. Mar. Vol. 19. No. 9. pp. 655–658. (Discussion pp. 658–660).

The author draws attention to obscure cases of kala azar in which there may be little fever or enlargement of the spleen and absence of the classical symptoms of the disease. Writing of medical practice in Bengal he states that all cases of anaemia and diarrhoea or dysentery with or without fever or enlargement of the spleen should be looked upon with suspicion.

C. M. W.

MAITRA (Jitendra Nath). **A Flagellate found in the Peripheral Blood Smear of a Case clinically one of Kala-Azar.**—*Calcutta Med. Jl.* 1924. Feb. Vol. 18. No. 8. pp. 618–619. With 1 plate.

The paper records the discovery in a blood film of a female patient, 16 years of age, in the surgical wards of the Campbell Hospital, Calcutta, of a flagellate having the characters of a leptomonas. The patient had an enlarged spleen, was anaemic, and her case clinically resembled one of kala azar. The serum globulin test was positive. It was not possible to confirm the diagnosis of kala azar and blood films made later did not reveal any more flagellates. Contamination of the film from the distilled water is regarded as excluded, as other films stained on the same day did not show the flagellates. A coloured plate shows three of the organisms, which are indistinguishable from cultural forms of leishmania. [It is particularly unfortunate that the case could not be thoroughly examined. One possible source of error, not mentioned, is the deposit on blood films of similar flagellates by house flies which have access to them. The reviewer knows of at least one case where such a contamination took place. It is perhaps worthy of note that the reviewer on one occasion found flagellate stages of leishmania in a spleen smear of a dog experimentally infected with *L. donovani* (this *Bulletin*, Vol. 7, p. 81).]

C. M. W.

BANERJEE (Dhirendra Nath). **Observations on the Occurrence of Leishmania in Ulcers of Stomach in a Case of Kala-Azar.**—*Calcutta Med. Jl.* 1923. Sept. Vol. 18. No. 3. pp. 385–388. With 1 plate. [7 refs.]

A Hindu female, aged about 45, admitted to hospital for anaemia, subsequently died of diarrhoea and malnutrition; post mortem 120 ancylostomes were found in the intestine and it was thought the case was one of ancylostomiasis. On examination of smears of the bone marrow the author was surprised to find a large leishmania infection. Parasites were subsequently found in smears of the spleen and liver and in scrapings from a number of ulcers which occurred in the posterior wall of the stomach. The last observation appears to the author to lend support to the view that kala azar is acquired by way of the alimentary canal.

C. M. W.

ELWES (F. F.), MENON (V. K. Narayana) & RAMAKRISHNAN (P. S.). **The Formol-Gel (Aldehyde) Test as a Means of Diagnosis of Kala-Azar.**—*Indian Med. Gaz.* 1924. Apr. Vol. 59. No. 4. pp. 175–177. [6 refs.]

Out of a total of 81 proved cases of kala azar no less than 23·4 per cent. gave a completely negative formol-gel test, and 12·3 per cent. gave a doubtful reaction. Thus in 35·7 per cent. of the cases the test was of little or no value. Furthermore, there is a certain group of cases which clinically appear to be kala azar and give a positive formol-gel reaction and react to potassium antimony tartrate, though leishmania cannot be discovered by liver puncture. It is doubtful if these cases are true kala azar.

In a note to this paper by NAPIER, it is pointed out that the formol-gel test has its limitations and that it depends largely on the duration of the disease. In early stages when parasites are numerous the reaction may be negative because normal metabolism has not yet been deranged, while it may be positive in treated cases which have completely lost their symptoms and all trace of parasites. It is thought that the suggestion that the cases showing symptoms of kala azar may be some other disease is extremely hypothetical and merely rests on an inability to find the parasites by liver puncture. In cases in which the parasites are scanty in the material obtained by spleen puncture it is usually impossible to find them by liver puncture. In certain cases as many as four spleen punctures have been performed without finding parasites by microscopical examination of smears, though a positive diagnosis has eventually been obtained by culture.

C. M. W.

STRUTHERS (E. B.) & CH'I CHANG CH'UN. **The Globulin Precipitation and Formol-Gel Tests in the Diagnosis of Kala-Azar.**—*China Med. Jl.* 1924. Mar. Vol. 38. No. 3. pp. 203–206. With 1 fig. [7 refs.]

The globulin precipitation test and the formol-gel test were applied to 141 cases of kala azar in China, all of them diagnosed by the discovery of leishmania, except one which was obviously this disease from the clinical features and the response to tartar emetic treatment. Only reactions decidedly positive were accepted. Of these 141 cases 92·9 per cent. gave a positive reaction with the globulin test and 98 per cent. with the formol-gel test. In 77 cases of other diseases the formol-gel test was uniformly negative. The cases of kala azar which failed to give a reaction were early ones, a result similar to that obtained by NAPIER in India. The globulin test employed was that of RAY and was carried out by adding from a pipette 2 drops of blood to 20 drops of distilled water in a test tube. If the test is positive a flocculent precipitate appears in a few minutes.

C. M. W.

DE CAPITE (A.). **Sulla gelatinizzazione del siero di sangue nella leishmaniosi infantile.**—*Pediatria.* 1924. Apr. 1. Vol. 32. No. 7. pp. 408–413. [16 refs.]

The author has used the formol-gel test in 18 cases of active kala azar, two cases of recovered kala azar, seven cases of splenic anaemia and 30 cases of illness due to other causes. Though the reaction may not be so rapid as NAPIER observed, the author is convinced of its reliability as a diagnostic procedure in kala azar. He does not claim that it can be expected to render search for the parasite unnecessary, but he considers it sufficiently accurate to justify a probable diagnosis of the disease. In the eighteen cases the reaction was obtained in 1 case in 10 minutes, in 2 in 15 minutes, in 4 in 30 minutes, in 2 in 45 minutes, in 3 in 1 hour, in 3 in 2 hours, in 1 in 4 hours, and in 2 in 6 hours. In 3 of the other cases in which it was obtained the time limit was 24 hours.

C. M. W.

SARKAR (Sarasi Lal) & DE (Anath Bandhu). **Some Observations on the Aldehyde Test.**—*Calcutta Med. Jl.* 1923. Dec. Vol. 18. No. 6. pp. 539–543.

Though it is concluded that the aldehyde test in certain cases of kala azar was a much delayed reaction, the results are invalidated by the fact that none of the cases were diagnosed by the discovery of leishmania. On this account also the remark that about one-third of kala azar cases undergo slow spontaneous recovery is of little scientific value.

C. M. W.

BRAHMACHARI (U. N.), CHAUDHURY (Saroda Charan), DAS (Judhistir) & SEN (Parimal Bikas). **Chemotherapy of Antimonial Compounds in Kala-Azar Infection. Part VIII. Quantitative Studies in Excretion of Antimony (Tartar Emetic and Urea Stibamine).**—*Indian Jl. Med. Res.* 1924. Jan. Vol. 11. No. 3. pp. 829–838. With 1 chart.

The authors have investigated the rate of antimony excretion after intravenous injections of tartar emetic and urea stibamine. In the case of tartar emetic the quantity excreted in the urine during the first 24 hours is about 6 per cent. of the amount injected; in the case of urea stibamine it is 30 to 40 per cent. The actual quantity excreted is fairly proportional to the amount injected and is independent of the quantity of urine passed. If a pentavalent antimony compound is injected the excretion during the first 24 hours is rapid, after which it is slower and follows the rate of excretion of a trivalent compound.

It is probable that in the body a pentavalent compound is reduced to a trivalent one and that so long as it remains in the pentavalent condition the excretion is rapid. Antimony may be present in the urine for two months after a single injection of an antimony compound. In the case of urea stibamine where the greater portion of the antimony is in a pentavalent condition the chances of toxicity from such a drug are less than from antimony tartrate. It is probable that during the conversion of a pentavalent to a trivalent compound a reactive $—\mathrm{Sb}=\mathrm{O}$ radicle is formed, which may perhaps explain the remarkably good results following the use of urea stibamine. The quantity of antimony excreted by the faeces is irregular and considerably less than that excreted in the urine. These observations, together with the fact that its therapeutic value is very great, make urea stibamine the best of all the antimonial compounds that have so far been discovered for the treatment of leishmaniasis, and other diseases in which antimony is indicated.

C. M. W.

BRAHMACHARI (U. N.). **Chemotherapy of Antimonial Compounds in Kala-Azar Infection. Part IX. Treatment of Cases of Kala-Azar Resistant to Antimonyl Tartrates with Urea Stibamine—the Therapeutic Value of Stibamine in Kala-Azar.**—*Indian Jl. Med. Res.* 1924. Apr. Vol. 11. No. 4. pp. 1,205–1,217.

The author describes his experiences with urea stibamine in the treatment of 9 cases of kala azar which had proved resistant to treatment with antimonyl tartrate; all responded at once to urea stibamine, and it is worthy of note that the course of curative treatment was shorter and the number of injections less than is usual with antimonyl tartrate. No case of kala azar met with up to the present has resisted treatment with urea stibamine, and some of the cases have been under observation for nearly 2 years after completion of the course. In the treatment of the 9 cases referred to the doses of the drug varied as follows :—1. Nine injections of 0·2–0·25 gm. twice a week. 2. Eight injections of 0·2 gm. twice a week. 3. Total of 3·5 gms. in 15 injections twice a week. 4. Nine injections of 0·1–0·25 gm. (total 1·6 gms.) in 1½ months. 5. Total of 3·0 gms. in 12 injections on alternate days. 6. Total of 2·2 gms. in 9 injections during 2 months. 7. Total of 2·4 gms. in 10 injections during 1½ months. 8. Doses of 0·1 to 0·25 gm. (total 2·8 gms.) in 13 injections during 2 months. 9. Total of 2·2 gms. in 12 injections during 1½ months.

It is noted that a further series of 6 cases which have resisted more than 4 gms. of tartar emetic or sodium antimonyl tartrate are rapidly improving under urea stibamine.

Both the author and Major SHORTT are testing the drug by intramuscular injection. The local reaction is generally very slight and it is possible that the drug may be used with advantage in this way.

An account of 3 cases treated with stibamine is also given. It is noted that unless the salt is perfectly neutral its solution in water is likely to decompose. The pure salt is fairly stable. The following doses were given :—1. Total 2·4 gms. in 20 injections during 54 days. 2. Total 1·2 gm. in 18 injections during 48 days. 3. Total 4·4 gms. in 30 injections during 100 days. All the cases were apparently cured.

C. M. W.

GERSCHENOWITSCH (R. S.). **[On the Comparative Value of Existing Methods of Treatment of Infantile Leishmaniasis.]**—*Russian Jl. Trop. Med.* Moscow. 1924. No. 2. pp. 11–16. [40 refs.] [In Russian].

The author had 25 cases of infantile leishmaniasis under observation, seven of which were treated with tartar emetic alone, by ROGERS' method, and eighteen by the combined method introduced by SLONIM. In the latter a dose of neosalvarsan is injected after every 4–5 injections of tartar emetic. The usual doses of both salvarsan and antimony were employed. In the series treated by ROGERS' method 3 cases recovered and 4 died, whereas in the series treated by SLONIM'S method 14 recovered and 4 died. The average number of injections of tartar emetic was 35 in cases treated according to ROGERS, and 25 in those treated by SLONIM'S method. The course of treatment by both methods lasted on the average 3–3½ months.

The author notes that the blood improves very slowly when antimony alone is used. The addition of neosalvarsan, however, causes a rapid improvement in the cell content and raises the haemoglobin index, the coagulability and the alkalinity.

C. A. Hoare.

STRUTHERS (E. B.). **Kala-Azar: Criterion of Cure.**—*China Med. Jl.* 1924. Mar. Vol. 38. No. 3. pp. 207-212. [4 refs.]

Since the adoption of the tartar emetic treatment for kala azar cases at the Shantung Christian University Hospital, Tsinan, China, the writer of the paper has experienced a difficulty in deciding when a case can be regarded as cured. It is concluded that at present there is no certain criterion of cure unless the failure to cultivate parasites from spleen material be so considered. The globulin precipitation test and the aldehyde test cannot be relied upon as indications of cure.

The most satisfactory indication appears to be increase in general well-being and weight, a return to normal temperature continuous for a month or six weeks, a decrease in the size of the spleen, and an increase in the leucocytes and haemoglobin of the blood. Prolonged treatment for three to five months is necessary.

Of 37 discharged patients who reported that they were in good health, 21 have been well for 2 to 6 months and 16 from 6 to 12 months. The general results for 100 patients discharged between January 1922 and November 1923 were as follows :—Cured, 61 ; improved (treatment incomplete), 18 ; died 21. The high death rate is accounted for by the fact that there was no refusal of cases in the last stages of the disease, many of whom died shortly after admission. The treatment adopted is on the lines of that recommended in India.

C. M. W.

SHORTT (H. E.) & SWAMINATH (C. S.). **Note on the Infection of a Mouse by Means of Bed-Bugs, *Cimex hemiptera* Fabr., fed on the Peripheral Blood of a Case of Kala-Azar.**—*Indian Jl. Med. Res.* 1924. Jan. Vol. 11. No. 3. pp. 965–966.

It is rare to find flagellates in bugs which have fed on the peripheral blood of kala azar cases solely by direct microscopical examination, but their presence can often be demonstrated by the cultural method. They are present at first in the mid-gut, but the longer the infection lasts the more do they tend to migrate towards the hinder end of the gut, where they may be detected long after they have entirely disappeared from the mid-gut. These forms are presumably passed in the faeces and may conceivably cause a new infection if introduced into the puncture wound. To test this point, bugs were fed on kala azar cases which showed parasites in the peripheral blood. They were dissected nine days later and the guts were emulsified in saline and injected intraperitoneally into mice. The minimum period of 9 days was chosen, as it had been found that flagellation of the ingested parasites occurs in 3 to 6 days, and it was presumed that at the 9th day all the forms present would be in the flagellate condition. Of five mice which were inoculated with the emulsion of 12 to 20 bug intestines one gave a positive result on the 123rd day. Direct examination of smears showed no parasites, but a culture was obtained from the spleen. No leishmania were obtained from the others, but the examinations were not satisfactory. One died in 24 hours after the inoculation, one was found dead with bacterial contamination of the organs, one gave only contaminated cultures, while one was killed in moribund condition from an undetermined cause on 37th day. It is thus demonstrated that 9 days after feeding on a kala azar case the intestine of bugs may contain leishmania which are infective to mice.

C. M. W.

SMYLY (H. Jocelyn) & YOUNG (Charles W.). **The Experimental Transmission of Leishmaniasis to Animals.**—*Proc. Soc. Experim. Biol. & Med.* 1924. Mar. Vol. 21. No. 6. pp. 354–356.

YOUNG (Charles W.), SMYLY (J. Jocelyn) & BROWN (Cabot). **Experimental Kala-Azar in a Hamster** (*Cricetulus griseus,* **M.-Edw.**).—*Ibid.* pp. 357–359. [1 ref.]

These two papers may be considered together as both deal with the marked susceptibility of the Chinese hamster (*Cricetulus griseus,* M.-Edw.) to *Leishmania donovani*. It is noted that the lack of an animal which can be readily and surely inoculated with *L. donovani* has been a serious obstacle to investigation work and it is hoped that in the hamster many of the difficulties may be overcome. The first paper describes the inoculation of a series of animals with material from emulsified spleen of a heavily infected case. Two dogs were inoculated intravenously with 5 and 4·5 cc. of the saline suspension, while 2 guineapigs, 2 white rats, 2 black mice and 5 hamsters were inoculated intraperitoneally with 0·3 to 0·5 cc. The results obtained in these animals were as follows. One dog gave a positive blood culture on the 38th day ; it died later but no autopsy was made. The other dog also gave a positive blood culture on the 42nd day ; after 4½ months the spleen, at autopsy, was found infected. The guineapigs were negative at autopsy on the 95th and 131st days, as also were the white rats on the 29th and 90th days. The black mice were positive on the 111th and 121st days. All the 5 hamsters were positive on the 8th, 45th, 116th and 351st days.

A second series of animals was inoculated from a case with light infection as follows :—2 dogs with 10 cc. and 5 cc. of spleen emulsion, 2 dogs with 10 cc. and 5 cc. of liver emulsion, 1 hamster with 1 cc. of spleen emulsion, 2 with 1 cc. of liver emulsion and 2 with 1 cc. of marrow emulsion. All the dogs were examined by liver and sternum puncture on 102nd to 107th day with negative result. One hamster was examined by autopsy on 105th day ; the spleen was infected. Liver puncture performed on three hamsters gave a positive result, as also did their examination at autopsy on 116th and 144th days ; a liver puncture was performed on the 5th hamster on the 131st day with positive result.

The second paper is a continuation and confirmation of the first. Of 89 hamsters inoculated intraperitoneally infection was demonstrated in 91 per cent. Intracellular organisms were found in the animals at varying intervals from 1 to 332 days after inoculation. To ascertain whether the organisms came from the tissues or from the unabsorbed material in the peritoneal cavity, 20 animals were inoculated and 4 were examined at daily intervals. In each animal the following smears were examined :—1. centrifuged peritoneal washings ; 2. liver rinsed twice to free it from inoculum ; 3. similarly washed spleen ; 4. bone marrow (femur). Intracellular parasites were found in the peritoneal cavity throughout the five days. They appeared first in the spleen (3 days) and then in the liver and bone marrow (4 days). In 2 other hamsters intracellular parasites were found in the peritoneal cavity as well as in the washed liver and spleen on the 9th day. Two hamsters inoculated intrapleurally became infected, as also did 2 out of 4 inoculated subcutaneously. Five hamsters were fed on infected material. Two of these died in 8 hours and one in 7 days. Two others were killed on the 18th day. All were negative.

As regards these infections it is noted that there was no tendency towards spontaneous recovery, the infection being progressive in its intensity.

C. M. W.

BANERJEE (Dhirendra Nath). **Cultivation of** *Leishmania donovani*.—
Calcutta Med. Jl. 1923. Sept. Vol. 18. No. 3. pp. 417–420.

After a summary of the various methods of culture of *Leishmania donovani* the author states that in his laboratory the best results have been obtained by Row's method. A half to 1 cc. of blood is placed in 20 cc. of citrate saline solution. After mixing thoroughly the tube is incubated for 24 hours at 22°C. With the sediment which has then formed tubes of N.N.N. medium are inoculated in the usual manner.

C. M. W.

NAPIER (L. E.). **The Reaction of the Blood in Kala Azar.**—*Indian Jl. Med. Res.* 1924. Jan. Vol. 11. No. 3. pp. 719–732. With 2 figs. and 5 graphs. [7 refs.]

Though it is generally known that the blood of kala azar cases shows a reduced alkalinity, the author repeated the investigation by the more accurate method for the determination of its hydrogen-ion concentration, using a slight modification of the colorimetric method suggested by DALE and EVANS. It was found that there is actually little change in the pH of the blood in this disease, and that slightly towards the alkaline side, the mean of the blood of 18 kala azar patients and 10 normal persons being 7·379 ± 0·065 and 7·329 ± 0·0415 respectively.

As a consequence the author has elaborated a colorimetric method of estimating accurately the pH of slightly coloured fluids of pH between 1·08 and 11·08. It is a combination of the methods described by DALE and EVANS (1920) and by EVERS (1921), and is applicable not only to blood, but also to urine and faeces. A new form of comparator is also described. The effect of the addition of various quantities of acid and alkali to the blood was studied. It was shown that in kala azar blood the power of neutralizing acid as well as alkali was reduced, so that it would be more accurate to state that in kala azar the " buffer " action of the blood is reduced. The paper is illustrated by a series of tables and charts.

C. M. W.

NAPIER (L. E.). **The Preparation of N.N.N. Media of Different Hydrogen-Ion Concentrations.**—*Indian Jl. Med. Res.* 1924. Jan. Vol. 11. No. 3. pp. 733–736. With 6 graphs.

As a preliminary to the study of the optimum pH conditions of N.N.N. medium for the cultivation of *Leishmania donovani,* the possibility of preparing media of various known hydrogen-ion concentrations and the changes which occur in the medium from day to day were investigated. It was found that the hydrogen-ion concentration changes from pH 7·7 on the day that it is made to pH 7·0 on about the eighth day, after which it increases so slowly that it can be regarded as constant. Medium of any hydrogen-ion concentration from pH 3·5 to pH 8·65 can be prepared by the addition of various quantities of N/10 HCl or N/10 NaOH to ordinary N.N.N. medium before it has " sets"

C. M. W.

NAPIER (L. Everard) & MURÜGESAN (P.). **The Viability of the Flagellate Stage of *L. donovani* with Reference to the Hydrogen-Ion Concentration of its Environment.**—*Indian Jl. Med. Res.* 1924. Apr. Vol. 11. No. 4. pp. 1219–1226. [6 refs.]

The authors, availing themselves of the results of the investigation just recorded, tested the effect of hydrogen-ion concentration in

N.N.N. medium on the growth of *Leishmania donovani*. They found that on the acid side growth occurs consistently down to pH 4·75; it occurs with less certainty at pH 4·55, while at pH 4·3 the flagellates are killed in 3 days. On the alkaline side the results are less consistent. Growth occurs at pH 8·38 fairly regularly, but much less so at pH 8·6 and apparently not at all at lower concentrations than this. The optimum appears to be pH 5·7 on the acid side and pH 7·3 on the alkaline side. The range over which growth will occur is pH 4·5 to pH 8·6.

It has been found that leishmania will remain alive in the stomach of the frog for 24 or even 48 hours but that in the rabbit death occurs almost immediately. The pH of the stomach contents of the frog is about 6·4 and that of the rabbit below 3·6, the mashed mucous membrane having a pH of 4·5.

The hydrogen-ion concentration of gastric juice of a healthy European is usually greater than pH 2·0, but that of the rice eating Indian is distinctly less and in conditions of ill-health may be as low as pH 6·0. That of the gastric juice of a breast-feeding infant is said to be about 5·0. The authors think that the experiments prove that the hydrogen-ion concentration of the stomach of man under certain conditions is such that it does not negative the possibility of the survival of flagellates in it.

C. M. W.

TANABE (Misawo). [**On the Conditions Necessary for the Development of** *Leishmania donovani* **in Vitro.**]—*Saikingaku Zasshi* (*Jl. of Bact.*). 1923. June. No. 333. [Summarized in *Japan Med. World.* 1924. Feb. 15. Vol. 4. No. 2. p. 46.]

The author has cultivated *Leishmania donovani* in the following medium. One part of defibrinated rabbit's blood is mixed with an equal quantity of distilled water. After complete laking 1 part of citrated saline solution (distilled water 900 cc., sodium chloride 12 gms., sodium citrate 10 gms.) is added. The resulting fluid separated in small tubes constitutes the medium. The blood of the dog can be used in place of rabbit's blood, but human and ox blood give less satisfactory results. The blood of the rat, guineapig, horse, goat and monkey were useless. The best results are obtained when rabbit's blood is present in 20–50 per cent. Neither the serum of rabbit's blood alone nor the erythrocytes alone can be used as a substitute for the whole blood. Oxygen appears to exercise no influence on the growth. A neutral medium is the best and no growth occurs if the medium is rendered alkaline or acid by the addition of 10 per cent. normal soda or hydrochloric acid solution. Both potassium chloride and calcium chloride can take the place of the sodium salt. The optimum temperature of growth was 22–25° C.

C. M. W.

DE (Monindra Nath). **A Simple Method of staining** *Leishmania donovani* **in Tissues.**—*Indian Med. Gaz.* 1924. Feb. Vol. 59. No. 2. pp. 82–84. With 1 fig.

For staining Leishmania in sections the following method is recommended. Small pieces of tissue about 0·5 cm. thick are placed in acetone, which is changed every five minutes till the tissue is clear. It is then placed in xylol, when it becomes perfectly clear and transparent, after which it is put in the paraffin bath at 60°C. for about half an hour. After embedding, sections 2–3 microns thick are cut and these are brought into water in the usual way. They are then stained by Giemsa or Leishman stain as in the case of an ordinary blood film. Excess of stain is washed away with water, and the sections are rapidly dehydrated with acetone, cleared in xylol and mounted in cedar oil.

C. M. W.

BARBERI (Salvatore). **Restauro dei proteici del plasma nel Kala-azar.**—*Pediatria.* 1924. Apr. 1. Vol. 32. No. 7. pp. 399–407. [3 refs.]

From an examination of four cases of infantile kala azar in Italy the author finds that the protein content of the blood is reduced. As recovery takes place improvement in the protein content can be observed before the blood count shows any change for the better.

C. M. W.

i. MUKHERJEE (H. N.). **Calcium Content of Blood in Kala-Azar. A Preliminary Note.**—*Calcutta Med. Jl.* 1923. Sept. Vol. 18. No. 3. pp. 394–396. [3 refs.]

ii. BANERJEE (Dhirendra Nath). **A Scheme for the Control of Kala-Azar in Bengal.**—*Indian Med. Rec.* 1924. Feb. Vol. 43. No. 2. pp. 36–38.

iii. GIRAUD (Paul) & ZUCARELLI (J.). **Le kala-azar infantile autochtone dans la région méditerranéenne.**—*Paris Méd.* 1924. Mar. 22. Vol. 14. No. 12. pp. 278–281. [9 refs.]

iv. AKAMATSU (Tokujiro). [**On Kala-Azar in Shangtung District in China.**] —*Jikken Igaku Zasshi* (*Jl. Experim. Med.*). 1923. Dec. Vol. 7. Nos. 11/12. [Summarized in *Japan Med. World.* 1924. Mar. 15. Vol. 4. No. 3. p. 79.]

v. IGLESIAS GARZA (Tomas). [**Una endemia grave de leishmaniosis infantil en España.**]—*Siglo Méd.* 1923. Nov. 24. [Summarized in *Rev. Española de Med. Cirug.* 1924. Mar. Vol. 7. No. 69. p. 163.]

i. From an examination of the blood of ten cases of kala azar and five normal individuals it was found that in kala azar there was a calcium deficiency which it is thought may account for the decrease in the coagulability of the blood in this disease.

ii. The scheme advocated is the proper training of local practitioners in the methods of diagnosis and treatment of kala azar so that the large number of cases in Bengal can be dealt with.

iii. It is evident that Marseilles is an endemic centre of infantile kala azar, for in addition to the four cases previously noted (this *Bulletin* Vol. 21, p. 253), a fifth case has come to light. The paper describes the five cases in detail, but gives no new information about the disease.

iv. A note stating that the author has discovered kala azar to be endemic in the Shantung Province of China.

v. A note calling attention to the existence of infantile kala azar in Spain.

C. M. W.

BONNE (C.). **La leishmaniose cutanée dans la Guyane hollandaise.**—*Bull. Soc. Path. Exot.* 1924. Apr. 9. Vol. 17. No. 4. pp. 293–295.

In Dutch Guiana the leishmania infection is found in the following forms:—(1). Non-ulcerating papule about the size of a franc piece. (2). Ulcer with a diameter of 1-6 cm. and forming an abundant secretion: this is the usual type. (3). Eczematous type only seen once. (4). Lymphangitic type with the lymphatics draining an ulcerated area thickened at intervals into nodules which may break down and give rise to secondary ulcers. (5). Hypertrophic type in which large protuberant masses of a papillomatous nature are formed. (6). Mucosal type in which the nasal and buccal mucosae are involved. All these types respond very readily to treatment with tartar emetic in 3 to 6 weeks, except the hypertrophic variety, which is very resistant and may require months of treatment. The disease, which is only contracted in the forest, is ascribed by the natives to the latex-containing spines of certain lianas. About 100 ticks (Amblyomma) fed on cases during several weeks did not yield evidence of any development of leishmania nor were cultures of the flagellate obtained from the stomach contents of ticks. A species of Phlebotomus (*P. squamiventris* Lutz and Neiva) occurs in the forests. Four specimens were obtained. They were crushed in saline and inoculated by scarification into the skin, but no infection resulted.

C. M. W.

SERGENT (Et.) & GUEIDON (E.). **Chronique du bouton d'Orient en Algérie. Le " Clou de Mila."**—*Arch. Inst. Pasteur d' Algérie.* 1923. Vol. 1. No. 1. pp. 1–3. [1 ref.]

The authors have been able to demonstrate that the disease long known in Algeria as " Clou de Mila " is oriental sore. Two cases were observed and leishmania were discovered in both. These are the 5th and 6th cases of oriental sore which have been seen in Algeria outside the Sahara district. Forty years ago the disease was so common at Mila that it received its distinctive name, but for some reason not properly understood it has gradually become less frequent, though the town itself with a population of 2,000 has undergone no visible change in the interval. The sand fly *Phlebotomus papatasii* exists, but whether any restriction of its breeding facilities has occurred cannot be stated.

C. M. W.

MONTENEGRO (João). **Inoculabilidade da leishmaniose.**—*Bol. Soc. Med. e Cirurg. de S. Paulo.* Brazil. 1923. Nov. Vol. 6. 3rd. Ser. No. 9. pp. 113–117.

————. **The Inoculability of Leishmania.**—*Amer. Jl. Trop. Med.* 1924. May. Vol. 4. No. 3. pp. 331–340. With 3 figs.

Though autoinoculation was supposed to account for the appearance of secondary lesions in the case of cutaneous leishmaniasis in S. America, the author determined to test this assumption by experimental means. A series of 7 cases of the disease was chosen and autoinoculation of the skin by scarification with material from a skin lesion was carried out on seven occasions. Though 4 of these inoculations caused the appearance of nodules, which never persisted for more than 3 weeks, in only one were definite leishmania discovered. One of the cases had a lesion of the nasal mucosa and with scraping from this an autoinoculation of the skin was performed as well as the inoculation of the skin of another case. There was no result from either of these experiments, nor from the inoculation of the skin of another case with a culture of leishmania rich in flagellates. Though the majority of the experiments gave inconclusive results, the positive one justifies the conclusion that autoinoculation can take place.

C. M. W.

MARZINOWSKY (E. I.) & SCHOURENKOFF (A. I.). **[Immunity in Oriental Sore.]**—*Russian Jl. Trop. Med.* Moscow. 1924. No. 2. pp. 17–24. With 2 figs. [35 refs.] [In Russian.]

A series of experiments on oriental sore were conducted with the view of elucidating the question of immunity in man. The authors repeatedly inoculated themselves in the arm from naturally infected cases in Turkestan, and summarize the results as follows:—

(1). The incubation period after the first experimental infection is about two months (60–70 days),

(2). Repeated inoculations from man to man reduce the period of incubation to a fortnight;

(3). The course of experimental infection is similar to that of natural infection;

(4). An experimental sore confers a distinct immunity only in those cases in which the resulting sore is allowed to run a natural course, and heal on its own account;

(5). Abortive forms of oriental sore in natural infections confer no immunity, which explains the cases of repeated infections described in the literature.

C. A. Hoare.

MONTENEGRO (João). **Anatomo-pathologia da leishmaniose cutanea. (Ulcera de Baurú.)**—*Bol. Soc. Med. e Cirurg. de S. Paulo.* Brazil. 1924. Jan. Vol. 6. 3rd Ser. No. 11. pp. 132–135; and *Ann. Paulist. Med. e Cirurg.* 1924. Jan. Year 12. Vol. 15. No. 1. pp. 5–11.

A histological examination of the type of cutaneous leishmaniasis known as ulcer of Baurú leads the author to the following conclusions. The lesion is a granuloma in which plasmocytes, lymphocytes and endothelial cells occur in varying proportions. In indolent lesions and during cicatrization gigantocytes occur. There is no definite necrosis or suppuration. Though the histological characters are not peculiar to the leishmania infections they nevertheless enable one to differentiate them from the common mycotic lesions. Certain syphilitic lesions cannot be distinguished from those due to leishmania.

C. M. W.

KLIGLER (I. J.). **On the Cultivation and Biological Characters of *Leishmania tropica*.**—*Amer. Jl. Trop. Med.* 1924. Jan. Vol. 4. No. 1. pp. 69–76. [4 refs.]

This paper gives an account of oriental sore as it occurs in and around Jericho. Of five cases studied each had two or more sores. CANNAN had already noted in 26 cases that a single sore was the exception. In the five cases studied by the author the parasites appeared to be scantier than they were in a case from Aleppo and another from Baghdad. Cultivation of the organism was effected in a medium differing from that used by NOGUCHI for the cultivation of ***Leptospira icteroides*** only in the addition of whole blood of the rabbit in place of serum. It was found that *L. tropica* was very sensitive to changes in reaction, for at pH 7·8 and 6·6 respectively there was no growth. The best reaction is pH 7·2. The tests were made in media the reaction of which was adjusted by hydrochloric and acetic acids, unbuffered, or buffered with phosphate. For sub-cultures it was found that NOGUCHI's serum medium was very satisfactory and that under a layer of paraffin at a temperature of 22°–25°C. cultures would remain alive for at least 6 months. The effect of various drugs on the growth of *L. tropica* was tested. It was found that after 2 weeks' incubation a medium containing 1 : 20,000–1 : 40,000 tartar emetic showed active flagellates, while that containing 1 : 10,000 did not. The figures for brilliant green, salvarsan and neosalvarsan were 1 : 400,000 and 1 : 200,000, 1 : 25,000 and 1 : 20,000 and 1 : 33,000 and 1 : 25,000 respectively.

[The cultivation of Leishmania in a medium similar to that described by the author has been previously noted. *Trans. Roy. Soc. Trop. Med. Hyg.* xv. 153 (WENYON).]

C. M. W.

MANGIN. **Au sujet du traitment du bouton d'Alep.**—*Bull. Soc. Path. Exot.* 1924. May 14. Vol. 17. No. 5. pp. 361–367.

A stay of 15 months in Aleppo gave the author an opportunity of studying the local form of oriental sore and of elaborating a method of treatment which has given such good results that he is led to describe it. The treatment adopted in any particular case depends on the condition of the sore and is based on the use of the following mixtures :—

Mixture I ..	Extrait de Javel (?Javelle water)	25 gms.
	Glycerine	100 gms.
Mixture II ..	Mixture I	1 part.
	Glycerine	4 parts.
Mixture III ..	Mixture I	1 gm.
	Lanoline	40 gms.

Lesions in the early papule stage are treated with hot applications of a 10 per cent. dilution of Mixture I till there is formed a scab which is scraped off. The sore is curetted and Mixture I is applied, but on a cotton wool plug, which is fixed in by dressing and bandage. This is repeated on 5 to 8 successive days.

Sores in the vesico-pustular condition are similarly treated, the cavity being cleaned out each day and the soaked cotton wool plug being brought into contact with the edge in which parasites develop. Usually the infection is arrested on the sixth day, after which dressings of Mixture II or III are used. Fully developed ulcers are treated in the same manner, after removal of the scabs. It is advisable to dry the cavity carefully before making the application and to cover the skin outside the ulcer with lanoline or other ointment to prevent autoinoculations. If sores are in the healing period with signs of cicatrization Mixture II or III can be employed. In the final stages application of Lugol's solution is often advantageous. Occasionally abnormal lesions of non-ulcerating type are met with. These are treated with hot applications of the mixture repeated till an open sore is formed, when the dressings are applied to the interior. It may be necessary to lance the sore. Sores on the mucous membranes, which are often multiple in the form of small ulcers, are satisfactorily treated with applications of bismuth salicylate. A severe case was seen in which the whole upper lip was involved.

The advantages of the line of treatment described above are:—

1. Economy; 2. Painlessness; 3. Clean, practical and rapid; 4. Action only on the infected tissue and not on the healthy skin; 5. Without danger. Of 54 cases thus treated cure was effected in 8 to 30 days.

In Aleppo oriental sore is most frequently met with at the end of the summer. Dogs are liable to infection on the nose and 3 cases treated were cured rapidly.

C. M. W.

MAZUMDAR (D. C.). **Notes on the Treatment of Oriental Sore by Intravenous Injections of Antimony Tartrate.**—*Indian Med. Gaz.* 1924. May. Vol. 59. No. 5. p. 238.

The author records his experiences in the treatment of oriental sore in the Indian General Hospital at Dera Ismail Khan during the year 1920–1921. About 300 cases were dealt with, and it was found that the best results were obtained by the use of intravenous tartar emetic combined with strong saline dressings on the sores. The average stay in hospital was 4 to 6 weeks.

C. M. W.

SERGENT (Et.), GUEIDON (E.), BOUGUET (A.) & CATANEI (A.). **Existence de la leishmaniose cutanée chez le chien dans une localité du Tell algérien où le bouton d'Orient est endémique chez l'homme.**—*Bull. Soc. Path. Exot.* 1924. May 14. Vol. 17. No. 5. pp. 360–361. [2 refs.]

Having discovered that the " Clou de Mila " in Algeria was actually oriental sore, as announced above, the authors noted that a dog in the same locality had ulcers in its nose and internal surface of both ears. Scrapings from these lesions showed numerous leishmania. This is the first demonstration of cutaneous leishmaniasis in dogs in the Mediterranean area. It has previously been discovered in dogs in Teheran and Turkestan, while the paper by MANGIN reviewed above records its occurrence in Aleppo.

C. M. W.

WOLFF. **Dermal Leishmaniasis in Surinam.**—*British Guiana Med. Annual for 1923.* pp. 19–20. [4 refs.]

A note on Forest Yaws in Surinam—an account of the earlier work of FLU and BONNE.

C. M. W.

RELAPSING FEVER AND OTHER SPIROCHAETOSES.

OLIVIER (J.). **Notes sur la fièvre récurrente.**—*Ann. Soc. Belge de Méd. Trop.* 1924. Jan. Vol. 3. No. 3. pp. 365–376.

This paper gives an account of the author's experiences in the treatment of relapsing fever during an outbreak at Usumbura in the Belgian Congo during 1921–1922. After a number of cases had been treated with 914 a dose of 45 to 60 centigrams was administered as a routine every five days till 7 or 8 doses had been given. The cases which were treated at the commencement of the illness responded best, but there were some on which the drug failed to produce any marked impression. A local rumour credited petroleum with specific powers in relapsing fever, but the author's experiments with this remedy proved it to be quite inefficacious. As regards immunity, it was found that this could not be regarded as absolute after recovery, as 4 cases were encountered in which there was every reason to believe that an attack 6 months after recovery was due to reinfection.

C. M. Wenyon.

RUSSELL (A. J. H.), AYYAR (Adisesha) & UBHAYA. **Epidemiological Observations on an Epidemic of Relapsing Fever in Madras Presidency.**—*Indian Jl. Med. Res.* 1924. Jan. Vol. 11. No. 3. pp. 791–806. With 2 charts & 1 map.

It has generally been supposed that the Madras Presidency has been free from relapsing fever, but the supposed immunity of this part of India is shown to be fallacious, for the authors have studied outbreaks which occurred during 1921–1923 in the Mysore State and other parts of the Presidency. The disease, as elsewhere in India, is one of the cooler months. It was most prevalent in the fertile regions amongst the agricultural labourers, and there was every reason to suppose that it was louse-borne.

C. M. W.

GREGORY (Arthur): **Chirurgische Erkrankungen als Komplikation nach Typhus exanthematicus und recurrens.** [Surgical Affections complicating Typhus and Relapsing Fever.]—*Deut. Ztschr. f. Chirurg.* Leipzig. 1923. Aug. Vol. 181. No. 1/2. pp. 66–73.

During the three years following 1919 Russia was ravaged by an unprecedented epidemic of relapsing and typhus fever. It is estimated that during 1920 as many as six million people suffered from typhus alone. While surgical complications were recognised before this the enormous incidence of these diseases during the epidemic gave surgeons a unique opportunity of studying them. During the 3 years 1920, 1921 and 1922 the author had under his personal observation 4,096, 970 and 2,171 cases of typhus fever and 203, 1,124 and 1,376 cases of relapsing fever. In the series of typhus cases the percentage showing surgical complications were 15·8, 10 and 4 respectively, while the relapsing fever series gave percentages of 3·4, 3·4 and 1·1.

The most common complication was suppuration of the subcutaneous tissue giving rise to abscesses. In the series of typhus cases the percentages showing this complication were 4·5, 3·7 and 1·2, the relapsing fever cases giving percentages of 2·1 and 0·8. These abscesses were generally difficult to cure. They lasted at least one month, often two or more months, and not infrequently led to fistulous conditions. Pyaemia occurred in 17 out of 7,237 cases of typhus fever and was only seen once in a relapsing fever case. Actual abscess of the skin was only seen in 5 of the 7,237 typhus cases. Furunculosis occurred in 23 of the typhus cases and carbuncle in 2. Suppurative lymphadenitis occurred in 0·3 per cent. of typhus and relapsing fever cases. Parotitis complicated 1·7 per cent. of the typhus cases and 0·2 per cent. of the relapsing fever cases. Purulent thyroiditis was noted in 4 of the typhus cases. Gangrene occurred in 82 typhus cases and in 3 relapsing fever cases. The gangrene affected the lower extremities most commonly, but occurred also in the skin of the gluteal region and cheek, the scrotum and penis, the skin and subcutaneous tissues in the form of decubitus acutus, the intestine and elsewhere. The gangrene appeared to result from thrombosis, and in the case of gangrene of the feet the operation of ligature of the popliteal vein seemed to give good results. Other complications noted were laryngitis necessitating tracheotomy, spondylitis, osteoperiostitis and osteomyelitis, arthritis, cystitis, orchitis, phlebitis with thrombosis, otitis and finally erysipelas, which was particularly common in typhus cases during 1920.

C. M. W.

WEISSENBERG (S.). **Ueber den Einfluss des Fleck- und Rückfallfiebers auf die Menstruation, Schwangerschaft, Geburt und Laktation.**—[The Effects of Typhus and Relapsing Fever on Menstruation, Pregnancy, Parturition and Lactation.]—*Zentralblatt f. Gynäkologie.* Leipzig. 1923. June 9. Vol. 47. No. 23. pp. 904–920.

The conclusions arrived at are as follows :—

1. Neither of these infections is the cause of any gynaecological disease and they leave the endometrium intact. While menstruation during illness and subsequently is continued normally, on rare occasions there is uterine haemorrhage, especially in the case of relapsing fever. In about one third of the cases transitory amenorrhoea is noted.

2. The febrile condition appears to have a purifying influence on the generative organs, as a result of which rapid conception occurs.

3. Pregnancy is often interrupted, the danger being especially noticeable in the case of relapsing fever. Abortion usually occurs in the first month. In the middle period it is less common, but towards the end it is again more frequent.

4. The onset of miscarriage is due to various causes, the final one always being found in the bacterial toxins or the ptomaines from the dead foetus, which act either directly or indirectly by influencing the internal secretions which stimulate the nerve centres.

5. During the early months uterine haemorrhage, which leads to detachment of the membranes and consequent death of the foetus, is the cause of miscarriage. In the later months it is never due to primary death of the foetus but rather to the premature onset of labour, a factor which may sometimes play a part during the early months.

6. This factor is also responsible for the cases of missed abortion.

7. Miscarriage and premature labour show no abnormalities; there is no extension of convalescence and no irregularities in lactation.

8. Pregnancy in itself does not influence adversely the course of typhus fever, a fact which also applies to the actual labour. Prognosis is good and the mortality low.

9. The nearer full term the more frequent are the chances of living children which survive.

10. The height of the temperature as also the severity of the disease bear no relation to the processes of menstruation, pregnancy and labour.

C. M. W.

KUDICKE (R.), FELDT (A.) & COLLIER (W. A.). **Untersuchungen ueber die Spirochäten aus Blut und Liquor von Recurrenskranken und ueber die Heilungsvorgänge beim Recurrens.** [The Spirochaetes from Blood and Cerebrospinal Fluid of Relapsing Fever Cases.] —*Ztschr. f. Hyg. u. Infektionskr.* 1924. Apr. 7. Vol. 102. No. 1/2. pp. 135–154. [33 refs.]

The chief conclusions arrived at as a result of the investigations described in this paper are as follows, the spirochaetes being isolated from human beings by the inoculation of mice.

1. Relapsing fever spirochaetes from an old laboratory strain, and those isolated during an afebrile interval from human beings inoculated with this strain may or may not differ from one another as regards their antigenic properties.

2. Strains of spirochaetes recovered from human beings during the intervals by inoculation into mice differ from one another and from the original mouse strain as regards their antigenic properties.

3. In their subsequent passage through mice these various strains gradually lose their differences.

4. Strains isolated during the second half of an interval may resemble those which appear at the following attack, while those isolated during the beginning of the interval differ from those present at the previous attack.

5. Strains isolated from the cerebrospinal fluid at different stages of the disease may differ from one another.

6. Strains simultaneously isolated from the blood and cerebrospinal fluid of a case almost always differ from one another.

7. The differences appear to be due to the antibodies which appear in the blood, one of which at least has a lytic action on the spirochaetes. Such antibodies are demonstrable also in the cerebrospinal fluid.

8. Whether these antibodies are alone responsible for the diminution in the number of spirochaetes which occurs at the crisis future investigations alone will show.

9. During the attack and especially during the crisis there are developed substances which cannot be regarded as specific, as they affect trypanosomes as well as spirochaetes.

10. It is possible to produce a superimposed infection during the interval in spite of the fact that the first infection is still in existence.

C. M. W.

DE BUEN (Sadi), RODRIGUEZ (Rafael) & CASA (Urbano). **[La fièvre récurrente dans la Province de Caceres (Espagne).]**—*Arch. de Cardiol. y Hematologia.* 1923. Sept. Vol. 4. No. 9. p. 316. [Summarized in *Bull. Office Internat. d'Hyg. Publique.* 1924. Feb. Vol. 16. No. 2. pp. 208–209.]

A record of 5 cases of relapsing fever in Spain, where the disease appears to be endemic. Owing to the unhygienic conditions under which the inhabitants live there is danger of extension of the outbreak, which at present is only of slight importance.

C. M. W.

VAN HOOF (L.). **Conservation du pouvoir infectieux de l'*Ornithodorus moubata* nourri sur reptiles et sauriens.**—*Bull. Soc Path. Exot.* 1924. May 14. Vol. 17. No. 5. pp. 376–378. [2 refs.]

The tick *Ornithodorus moubata* will feed on chameleons and small snakes. Ticks kept in this manner do not thrive very well, there being a high mortality rate. Nevertheless, the author was able to demonstrate that though nourished in this way they continued to remain infective as regards *Spironema duttoni.* The reptile blood did not appear to stamp out the infection in the ticks, which was handed on to the subsequent generation as normally occurs.

C. M. W.

INGRAM (A.). ***Ornithodorus moubata*, Murray, in Relation to Relapsing Fever in the Gold Coast.**—*Ann. Trop. Med. & Parasit.* 1924. Apr. 30. Vol. 18. No. 1. pp. 95–97. [2 refs.]

An epidemic of relapsing fever in the Gold Coast was not dependent upon *Ornithodorus moubata,* which appears to be absent from this colony. A number of ticks were, however, secured from elsewhere and experimental transmission of the spirochaete was attempted without success by feeding the ticks on infected and healthy pouched rats. A number of ticks which had fed on an infected pouched rat were also sent to the Liverpool School of Tropical Medicine, where they failed to produce infection in two rabbits and a monkey. It would appear that *Ornithodorus moubata* is not an efficient carrier of the spironema which caused the recent outbreak of relapsing fever in the Gold Coast.

C. M. W.

SINTON (J. A.). **A Clinical Method for the Cultivation of the Parasite of Indian Relapsing Fever** (*Spirochaeta carteri*).—*Indian Jl. Med. Res.* 1924. Jan. Vol. 11. No. 3. pp. 825–828. With 1 plate. [7 refs.]

The author has applied the method devised by him for the cultivation of the malarial parasite to that of the spirochaete of relapsing fever (see this *Bulletin,* Vol. 19, p. 868). The organism was cultivated from two cases. In one case hydrocele fluid was used, to every 100 cc. of which 1·5 cc. of a 50 per cent. glucose solution was added. In the other, horse serum was used in place of the hydrocele fluid. The blood was taken by the method devised for the culture of malarial parasites, and after inoculation the tubes were incubated at 37° C. In both tubes agglomerated masses of spirochaetes appeared, and as the organisms in the original blood were not more than one in every seven fields, it was evident that active multiplication had taken place. In the case of the second culture, numerous active spirochaetes were present six weeks after inoculation of the tube, which after a week's incubation at 37° C. had been kept at laboratory temperature.

C. M. W.

D'AVIGNY (G. Prudot). **Evolution de la formule leucocytaire chez les malades atteints de récurrente au cours d'une épidémie (Soudan 1923).**—*Bull. Soc. Path. Exot.* 1924. Feb. 13. Vol. 17. No. 2. pp. 115–119. With 2 charts.

A study of the blood during an epidemic of relapsing fever among Senegalese troops showed that the number of polynuclear leucocytes at the commencement of the disease was slightly below normal. There was a progressive diminution in their number up to the crisis, when there was an increase which reached a maximum above normal just as the relapse was about to occur. During convalescence there was a gradual return to normal. The changes in the number of large mononuclears was more marked. They remain above normal from the commencement of an attack, increasing in number to a maximum which is reached just before the crisis. During the interval they decrease in number, reaching the normal or slightly below it just before the relapse. As regards the lymphocytes a similar change is noted. These results agree with the statements of other observers. From the point of view of diagnosis the blood picture at the commencement of the disease is of little value unless reliance can be placed in a diminution in the eosinophiles.

The changes undergone by the mononuclears may be looked upon as an indication of the course the disease may be expected to take.

C. M. W.

TROLLI (G.). **Un cas de fièvre récurrente traité par le novarsénobenzol Billon. Ictère toxique.**—*Ann. Soc. Belge de Méd. Trop.* Brussels. 1924. Jan. Vol. 3. No. 3. pp. 209–212.

A case of relapsing fever was treated with novarsenobenzol. Two doses of 0·3 and 0·4 gram were administered with no untoward reaction, but when a third dose was given there was a febrile reaction associated with tachycardia, neuritis of the circumflex nerves, erythematous eruption and intense jaundice. Spirochaetes were absent from the blood and they did not reappear later. The author considers this to be a case of intoxication due to the drug, such as other observers have noted in the treatment of syphilis.

C. M. W.

ŻAWRYNOWICZ (A.) & ALISOW (P.). **W sprawie bakterjologji powikłań laseczników owych (przewaznie paratyfusowych) duru powrotnego. Ein Beitrag zur Bakteriologie der bacillären Komplikationen des Rückfallfiebers.**—*Medycyna Doświadczalna i Społeczna.* Warsaw. 1923. Oct.-Nov.-Dec. Vol. 1. No. 5–6–7. pp. 360–377. German summary pp. 376–377. [21 refs.]

Various authors have recorded the isolation from the lesions of septic conditions which occur as complications of relapsing fever, of bacilli which resemble those of the paratyphoid group. The view has been advanced that this is a specific organism, but an investigation of 66 strains leads the authors of this paper to the conviction that they are really various inhabitants of the intestine which have found their way into the tissues. Though they may add to the severity of the disease, they cannot be regarded as one specific organism.

C. M. W.

SAGEL. **Zur Behandlung der Dementia paralytica mit Recurrens Duttoni.** [Treatment of G.P. with *S. duttoni.*]—*Muench. Med. Woch.* 1924. Mar. 21. Vol. 71. No. 12. pp. 369–370.

The author gives his experiences in the treatment of 72 G.P.I. cases with relapsing fever. He discusses the course of the superimposed infection in detail and the changes which took place in the nervous symptoms of the patients. He is in agreement with PLAUT and STEINER and with MÜHLENS and KIRSCHBAUM that this method of treating general paralysis has its value, but that one must not expect too much. Nevertheless, the course of the disease is favourably influenced in various ways. For the treatment of the cases relapsing fever is less dangerous than malaria.

C. M. W.

PONS (R.). **Notes sur la spirochétose bronchique.**—*Bull. Soc. Path. Exot.* 1924. Feb. 13. Vol. 17. No. 2. pp. 170–179. [37 refs.]

In this paper the author has examined the various records of bronchial spirochaetosis and has come to the conclusion that it is impossible to recognise such a disease clinically, basing his remarks on observations which he has made in Saigon. He refrains from describing the symptoms of his 9 cases of this so-called disease, for fear of adding to the existing confusion, if this is possible.

He commences by pointing out that the condition, supposed at one time to be limited to the tropics, has now been met with wherever it has been looked for. In Saigon the systematic examination of the buccal mucus of healthy individuals shows that they may be divided into two classes. In eight out of every 10 persons the spirochaetal flora of the mouth is scanty; in the remainder spirochaetes are numerous. Dental caries certainly favours their presence. It is worthy of note that the 9 cases of bronchial spirochaetosis studied, all belonged to the second category with a rich buccal flora. In the mouth the spirochaetes are distributed generally and may be recovered from any part of the buccal cavity. The question arises as to where this infection may spread. An autopsy which the author had an opportunity of performing has helped to throw light on this matter. A patient who said he had expectorated blood-stained mucus came into hospital and was actually found to be coughing up small quantities of mucopurulent sputum. There were certain lung signs which led to a diagnosis of phthisis, but no tubercle bacilli could be discovered. The sputum, even after washing out the mouth, contained numerous polymorphic spirochaetes—3 to 10 per field. The buccal flora was also very rich. The patient died of aortic disease. At post mortem there was a complete absence of any pleuro-bronchial lesions. At the origin of the bronchi there was a slight submucosal sanguineous effusion. Smears were made from all parts of the bronchi and these revealed the fact that the spirochaetes were numerous near the mouth, were less numerous in the larynx, still less at the middle part of the trachea and very scanty at the origin of the bronchi. Below this, in spite of the examination of numerous films, no spirochaetes could be found. It appeared logical to the author to conclude that the spirochaetes discovered in the sputum before death were those discovered at post mortem and that they were identical with those which occurred in the mouth. This lends support to the view expressed by TROCELLO that the oral spirochaetes could extend to the bronchi.

Testing the effect of oral lavage on the spirochaetal flora it was found that this had little effect in reducing their numbers in the parts which would be most easily reached, and that it had no effect on the numbers in more inaccessible recesses.

Considering the statements that have been made as to the individuality of the bronchial spirochaete and its distinguishing morphological characters, and comparing them with his own observations, the author was driven to the conclusion that it is practically impossible to differentiate *S. buccalis* from *S. bronchialis*. Such statements as those which affirm that the oral forms are less motile and retain their motility longer than those from the bronchi and do not produce the coccoid bodies to the same extent could not be verified except in the case of the rapid loss of motility of the bronchial spirochaetes. An attempt was made to differentiate the two forms by means of the index suggested by de MELLO (this *Bulletin*, Vol. 20, p. 137), but discordant results were alone obtained. Fusiform bacilli were always found in association with the spirochaetes, though sometimes they were present in very small numbers. Lavage of the buccal cavity by an antiseptic does not eliminate the possibility of spirochaetes contaminating sputum which is coughed up, and under certain conditions and quite apart from any specific pathogenic action the buccal flora may extend to the larynx and trachea.

When an attempt was made to obtain from the literature describing this condition the clinical picture of the disease, the author realised that polymorphism, if not the greatest confusion, appeared to be the dominating clinical characteristic. It was then that the author saw that to give the symptoms of his 9 cases would be merely adding to the existing chaos. Though several authors claim to have observed cases resulting from contagion, nothing of the kind was associated with the 9 cases studied, nearly all of which were in individuals who were living in close association with others who were free from the condition.

Attempts to reproduce the disease by intratracheal inoculation of rabbits failed.

On the subject of treatment the author points out that the supposed spirochaetal etiology of the condition fixed attention on the arsenicals. He could obtain no evidence that these had any real influence on the infection; on the contrary, a case which was being treated with arsenicals for syphilis developed the condition during the course of treatment.

The author sums up by stating that a disease is determined by certain cardinal features which allow of a diagnosis from the point of view of etiology, epidemiology, symptomatology and therapy. In the case of bronchial spirochaetosis the diagnosis depends solely on the discovery of spirochaetes, which is subject to numerous errors, while the spirochaetes themselves are lacking in individual characters. Clinical examination cannot identify the condition. Furthermore, there is no proof yet available of the pathogenicity of the spirochaete, which is merely an indication of an affection or group of affections. It appears possible that the spirochaetes merely develop in those localities in which conditions favourable to their growth occur. A case is mentioned of a man with tuberculosis who later developed a spirochaetal infection of the respiratory tract, as evidenced by the appearance in the sputum of these organisms which were specially numerous in the blood-stained portions. This patient had a heavy oral infection, and it appears that the abnormal condition set up by the tubercle bacilli afforded an opportunity for the oral spirochaetes to spread to the air passages. With recovery and disappearance of blood from the sputum the spirochaetes disappeared also. The author does not believe, however, that the spirochaetes are purely saprophytes. He rather thinks that they afford evidence of an abnormal condition due to varying causes and that they are able to give to these conditions characters such as chronicity and ulceration which one is accustomed to associate with the occurrence of spirochaetes in a lesion. [This view appears to be similar to that of DELAMARE on intestinal spirochaetosis (see paper reviewed below).]

C. M. W.

DE MELLO (Froilano). **Identificação morfologica do** *Spirochaeta bronchialis* **Cast. e sua diferénciação dos espiroquetas das arcadas alveolo-dentarias.**—*Bol. Geral Med. e Farmacia.* Bastora. 1924. Feb. 9th Ser. No. 2. pp. 46–59. [8 refs.]

This paper appears to be a continuation of one previously published (this *Bulletin,* Vol. 20, p. 137). The assertion is again made that it is possible to distinguish the bronchial spirochaetes from those of the mouth, and the index mentioned in the previous paper is again employed as a means of differentiating the organism. [In the paper by PONS reviewed above the author made an attempt to test the value of this index, but obtaining discordant results he had to abandon it.]

C. M. W.

DELAMARE (G.). **Divisions transversales et longitudinales chez** *Spirochaeta vincenti* (**variété** *bronchialis*).—*C.R. Soc. Biol.* 1924. Mar. 14. Vol. 90. No. 9. pp. 611–612.

The author has studied the spirochaetes of the bronchi in stained films and believes he has demonstrated multiplication by longitudinal as well as by transverse division. The two processes as he has observed them are described in the paper.

C. M. W.

DE MELLO (Froilano). **Deux nouveaux cas de spirochétose bronchopulmonaire.**—*Bol. Ger. Med. e Farmacia.* Bastora. 1924. Jan. 9th Ser. No. 1. pp. 7–10. [5 refs.]

A record of two cases of spirochaetal bronchitis from Angola.

C. M. W.

KOUWENAAR (Willem). **Spirochaetosis febrilis, een in de tropen voorkomende kortdurende koorts.** [Spirochaetosis febrilis, a Tropical Fever of Short Duration.] [M.D. Thesis, Amsterdam.]—pp. xi + 176. With 33 charts in text. [61 refs.] 1924. Amsterdam: S. L. van Looy.

Kouwenaar in Deli (Sumatra) distinguishes two types of this fever of 5–7 days, both caused by *Leptospira pyrogenes* Vervoort 1922, a Leptospira of the usual type 0·25 × 10–14μ, the ends curved and with 24 minute spires, and pathogenic for guineapigs.

The spirochaetosis simplex (58 cases examined), without icterus and never ending fatally, shows various types of fever; the "saddle-back" type is common, but other types (3-days fever; interrupted fever with relapse of 2 days on the 5th or 6th day; continuous; intermittent; irregular; fever with a relapse after 3–5 days; or an insignificant fever hardly ever surpassing 38° C.) are likewise to be found. The fever differs from dengue by its irregularity and the prevalence of a short relapse 3–5 days after the end of the principal fever: it lasts longer than papataci fever and, on the whole, resembles most the Japanese "Nanukayami." A skin eruption is seen on the 4th–6th day in 9 per cent. of the cases. Leucocytosis is usual, accompanied by a shifting to the left of the Arneth scheme, often also by lymphopenia; after the fever is over the normal number of leucocytes is re-established, so is the normal Arneth scheme, but there is a temporary lymphocytosis. The resistance of the red blood corpuscles is normal (*i.e.*, haemolysis in 0·35–0·45 per cent. salt solution). Haemorrhages (nasal) are rare; glandular swellings frequent. Urobilin is always present in urine, bilirubin never; febrile albuminuria and nephritis are frequent.

The spirochaetosis febrilis with icterus (31 cases with 6 deaths) shows the same symptoms as the simple type but more intensely. The exanthem, if present, made its appearance on the 6th–12th day; haemorrhages (nasal, dermal, gingival) were more frequent, as were the relapses of the fever after 3–5 days. The resistance of the red blood corpuscles was heightened during the period of icterus (haemolysis at 0·28–0·35 per cent. saline); during leucocytosis lymphopenia was not well marked. Bilirubin was always present in the urine. Post mortem examination showed icterus; haemorrhages; degeneration and focal inflammation of the liver; heightened phagocytal and haemolytic action of the reticulo-endothelial system (liver, spleen, lymphatic glands); degeneration of muscles of the heart, sometimes with myocarditis; inflammation of the walls of dermal capillaries; bronchitis and pneumonia. The leptospirae were found in the kidneys, liver, spleen, mesenteric glands, heart-muscles; not in suprarenal glands, skin and lungs.

In both types the leptospirae are to be found in the blood (by culture-methods) till the 6th–10th day, in the urine (by culture or direct examination) after the 5th or 6th day. Guineapigs could be infected with the urine, not with the blood. But in the case of the leptospirae from a simple spirochaetosis the strain lost its virulence after the 3rd passage, whereas leptospirae from icterus cases conserved their virulence after the 5th passage.

The incidence (both types taken together) is rather high (*e.g.*, 42 cases among a coolie population of 1,200 within one month), the months December-January and July yielding the highest figures.

Epidemics composed of the simple type only were not infrequent, but the icterus type never occurred alone.

It is concluded that these fevers cannot be identified with dengue, papataci and "Mossman" fever; that some of them, but not all, are very much like Weil's fever and that the simplex cases resemble most nanukayami. It is left undecided whether the two types represent two distinct diseases or whether they are nothing but a mitigated and a grave variety of one and the same disease.

N. H. Swellengrebel.

DELAMARE (G.). **Diagnostic microscopique et valeur sémiotique des grandes décharges de spirochètes fécaux.**—*Bull. et Mém. Soc. Méd. Hôpit. de Paris.* 1924. May 22. Year 40. 3rd Ser. Vol. 48. No. 17. pp. 725–729.

The fact that in perfectly healthy persons spirochaetes may be found in small numbers in the faeces and that in others suffering from some form of colitis enormous numbers may be found has led the author to enquire as to the limits of the intensity of infection which indicate the border line between health and disease. He thinks that 6 to 10 spirochaetes per field (presumably of the 1/12 objective) is the standard to adopt. It seems to him probable that as the spirochaetes are found to be numerous in such a variety of different conditions it is impossible to attribute any particular disease to their presence. It appears as if they multiply rapidly when the intestine is in a condition favourable to their growth. Their frequency in such conditions as cholera and amoebic infections is a case in point. Without attributing to the spirochaetes any pathogenic properties, their presence in large numbers is nevertheless an indication that the intestine and especially the colon is in an abnormal condition. And when the symptoms of that condition, or other reasons, suggest a possibility of cholera or amoebiasis the discovery of spirochaetes in the faeces alone should be taken as an indication that further examination for the specific organism may be successful. [The views expressed in this paper are similar to the conclusions arrived at by PONS above, in connexion with bronchial spirochaetosis.]

C. M. W.

v. ANGERER (Karl). **Filtrationsversuche mit Wasserspirochäten.** [Filtration Experiments with Water Spirochaetes.]—*Arch. f. Hyg.* 1924. Vol. 92. No. 7. pp. 325–328.

Owing to the conflicting statements that have been made as to the possibility of water spirochaetes being able to pass through a Berkefeld candle, the author repeated the experiment. He found that such a passage was possible but that it depended on the pressure. With the lowest possible pressure the spirochaetes did not pass through. When colloids were present in the medium the passage was hindered to a greater extent than by lowering the pressure. Young cultures yielded spirochaetes which passed through more easily than those of old cultures. It is essentially the living spirochaetes which can make their way through the filter. The filtrates were controlled by direct examination and by culture and no evidence was obtained of the existence of any granule or invisible stage of the organisms.

C. M. W.

PONS (R.). **Sur l'existence, dans les liquides souillés de sang, de filaments, non organisés, pouvant être confondus avec des spirochètes.**—*Bull. Soc. Path. Exot.* 1924. Apr. 9. Vol. 17. No. 4. pp. 307–309. With 1 fig. [1 ref.]

Attention is called to the filaments which can be observed in fluids contaminated with blood and might be confused with spirochaetes. They originate from the stroma of the red cells and are of two types. The one type is a short filament 8–10 microns in length and 0·2–0·3 microns in breadth. The ends appear to be slightly swollen and more refractile than other parts of the filament, which itself is made up of a series of particles. Though exhibiting Brownian movements they do not progress when observed in relation to other particles in the fluid. The other type is a long filament 8–20 microns in length. It is finer than the filament of the first type and may reach the limit of visibility in this respect. It appears to have the form of a ribbon and, like the others, has a refractile granule at each extremity. No movement of progression could be observed in them. Unlike true spirochaetes, they cannot be satisfactorily stained, so that confusion with spirochaetes ought not to occur. [Attention was called to these filaments, which were shown in an illustration, in this *Bulletin*, Vol. 21, p. 282.]

C. M. W.

CHAPUT (P.). **Les arsenicaux employés dans le traitement des affections spirillaires.**—*Arch. Med. et Pharm. Milit.* 1923. Oct. Vol. 79. No. 4. pp. 501–531. [11 refs.]

In this paper an account is given of the chemistry and interrelationships of the chief organic compounds of arsenic used in medicine. Beginning with BECHAMP'S discovery of atoxyl in 1860–1863, the author shows that little progress was made until EHRLICH and BERTHEIM in 1907 discovered the real nature of this substance, and by revealing the presence in it of an unaltered amino-group made atoxyl the parent of practically all the synthetic arsenical drugs of the present day.

EHRLICH'S hypothesis that aromatic arsinic acids, such as atoxyl, only became spirillicidal on reduction in the body to trivalent arsenic compounds led to the researches which produced the arsenobenzenes (salvarsan, neosalvarsan, etc.), but, in conjunction with EHRLICH and HATA'S observation that these pentavalent arsenic compounds gave rise to nervous troubles, it had also the effect of diverting attention from the simpler derivatives allied to atoxyl, until FOURNEAU and other workers in France reverted to this line of work in the last few years, and have shown that some of these compounds, *e.g.* the hydroxyaminophenylarsinic acids, may prove to be useful spirillicides.

Full justice is done to this and other French work on this subject, but in the account of the arsenobenzenes no mention is made of the important work done in this country by FARGHER and PYMAN and later by KING on the accessory constituents of commercial salvarsan, nor to the American work on the same subject, and in the very condensed account of the so-called " metallic derivatives of salvarsan " no mention is made of the considerable body of evidence brought forward by GRAY in this country and by other workers in Germany and the United States that silver salvarsan, the best known of these supposed co-ordination compounds of salvarsan, is merely a mixture of sodium salvarsan and colloidal silver.

T. A. Henry.

RAT BITE FEVER.

ONORATO (Raffaele). **Il sodòku in Tripolitania.**—*Arch. Ital. Sci. Med. Colon. Tripoli.* 1923. May, June, July-Aug.-Sept., & Oct.-Nov.-Dec. Vol. 4. Nos. 5, 6, 7-8-9, & 10-11-12. pp. 156–159; 162–191; 193–218; & 221–238. [52 refs.]

Having under his care in Tripoli a woman and her child who were both suffering from rat bite fever, the author conducted a long series of investigations involving a search for the organism in the two cases, inoculation of animals and the culture of the organism from the cases and the experimental animals. In both cases, as well as in the inoculated animals and in the culture, there were present organisms of two types. The one corresponded to the small one usually associated with the disease, while the other resembled a leptospira. Attempts were made to separate these but without avail, so that the author is finally driven to the conclusion that the causative agent of rat bite fever is a polymorphic organism and that both types are merely different developmental stages of one and the same organism. [It seems possible that the second type, which is said to be 8–9 microns in length, with movements which are undulating rather than spiral-like, might be merely blood filaments. The author does not mention the filaments themselves, and as he does not appear to have observed any connecting links between the two types of organism described it is conceivable that he was mistaking filaments for leptospira-like organisms. Even if this explanation is correct it does not invalidate the results of his work, for the leptospira-like structures are always associated with the short organism, which is certainly a definite parasite.]

The chief interest of the work lies in the successful culture of the organism, which has been attempted without success by many observers since the announcement of a method of cultivating it by FUTAKI and his collaborators in 1917 (this *Bulletin*, Vol. 13, p. 338). Two media were employed. The first was that of SHIMAMINE. It was prepared by dissolving by shaking 0·5–0·75gm. of nucleinate of soda in 100 cc. of horse serum and then passing through it for 3 or 4 minutes a current of anhydrous carbonic acid gas. The medium is then heated to 60°C. for an hour on 3 consecutive days and finally for half-an-hour at 65°C. on the 4th day. The medium, which is then ready for inoculation, consists of a solid and a liquid part. The other medium employed was what the author calls haemolysed rabbit serum medium. He does not give the details of its method of preparation. The organism grows at 25°–26°C. and is a facultative anaerobe. Many of his cultures were made aerobically, but under these conditions the growth is less intense and less regular. In both cases search for the organism in the urine, sweat, cerebrospinal fluid, blood, skin at site of eruption and lymphatic gland was made by direct microscopic examination of stained films and by dark ground illumination of moist films, by inoculation of animals and by culture. In both cases the blood gave a positive result by all these methods, while in one case the organism was isolated from the skin by the inoculation of an animal and in the other from a lymphatic gland by the same method.

Of the infected animals a detailed examination of a large number was made. In most cases both by the culture method and by the inoculation of other animals the organism was recovered from the blood, cerebrospinal fluid, urine, lymphatic gland and various internal organs.

In many cases it was discovered in these situations by direct examination of stained smears or by dark ground illumination. The constancy with which the author obtained positive culture from these animals indicates that he has used a reliable method for cultivating the organisms. The details of the numerous experiments and observations in the two cases and in the experimental animals are arranged in four elaborate tables. In addition to the experimental work outlined above the paper gives a careful description of the two cases, the course of the temperature being illustrated by two instructive charts. Furthermore, the author gives a very good review of most of the previous work and observations on this disease, failing, however, to mention the work of Row in India. Apart from the successful culture work the paper contains little new information.

C. M. Wenyon.

DUJARRIC DE LA RIVIÈRE (M. R.). **Contribution à l'étude des spirochétoses. Le sodoku.**—*Ann. de Méd.* 1918. Mar.–Apr. Vol. 5. No. 2. pp. 184–205. With 3 figs. & 4 charts in text. [59 refs.]

This is a critical review which does not pretend to give any new information on rat bite fever. Dealing with the nomenclature of the causative organism the author points out that the name *Spirochaeta morsus muris* given to it by FUTAKI, TAKAKI, TANIGUCHI and OSUMI in 1916 cannot stand, as, being trinomial, it does not conform to the rules of nomenclature. He therefore proposes the name *Spirochaeta japonica.* As regards the similar organisms which have been found in rodents, though they are morphologically indistinguishable from the one causing rat bite fever he is of the opinion that they cannot be identified with it as they are not pathogenic to the same extent. He is of opinion that *S. laverani* Breinl and Kinghorn, 1906, *S. muris* Wenyon, 1906, *S. muris* var. *virginiana* MacNeal, 1907 and *S. muris* var. *galatziana* Mezinescu, 1909, are all identical with the form described by CARTER in 1887 as *Spirillum minor.*

C. M. W.

O'LEARY (Paul A.). **The Dermatologic Aspects of Rat-Bite Fever.**—*Arch. Dermat. & Syph.* 1924. Mar. Vol. 9. No. 3. pp. 293–304. With 6 figs. [20 refs.]

The paper describes two cases of rat bite fever in America. From neither was the causative organism isolated, but response to arsenical treatment was immediate. The cases appeared to be typical and the skin eruption, which is well illustrated in a series of photographs, conformed in practically every detail to the published accounts. It is erroneously stated that so far only Japanese observers have been successful in isolating the organism.

C. M. W.

ROW (R.). **On the Rat-Bite Spirochaete.**—*Indian Jl. Med. Res.* 1924. Apr. Vol. 11. No. 4. pp. 1283–1284. [6 refs.]

Reference is made to a paper by PARMANAND (this *Bulletin,* Vol. 20, p. 881). The author states that in this practically all his observations on rat-bite fever in India were confirmed by PARMANAND except the claim made by him that he had been able to demonstrate flagella in the organism. Row thinks that PARMANAND's statement regarding the flagella is still debatable and considers that the question of the identity of the Bombay organism and that of Japan, the crux of which is the presence or absence of flagella, is still *sub judice.*

C. M. W.

MOOSER (H.). **Experimental Studies with a Spiral Organism found in a Wild Rat.**—*Jl. Experim. Med.* 1924. Apr. 1. Vol. 39. No. 4. pp. 589–602. With 3 plates. [15 refs.]

The author made an experimental study of an organism, which appeared to be that of rat-bite fever, which he discovered in the blood of the rat *Mus decumanus.* It was inoculable to rats and guineapigs, the infection in the latter being fatal. On one occasion a guineapig was infected by the bite of another guineapig which harboured the organism. Eye lesions were found in all the guineapigs, and the organism was found in the discharge from the eyes as well as in the cornea. Similar lesions occurred in most of the rats, and the secretion from the eye in one case was proved to be infectious to a guineapig. The author concludes that the eye lesions are an evident and possibly the only source of the spiral organisms transmitted by biting. He thinks it is possible that Weil's disease may sometimes be accounted for in this manner.

C. M. W.

MATSUMOTO (Shinichi) & ADACHI (Yogoro). [**On the Primary Sclerosis in Rat-Bite Fever of the Rabbit.**]—*Hifuka Kiyo* (*Arch. of Dermat.*). 1923. July. Vol. 1. No. 4. [Summarized in *Japan Med. World.* 1924. Feb. 15. Vol. 4. No. 2. pp. 42–43.]

This is a short note on the results of inoculation of the organism of rat-bite fever into the subcutaneous tissue of the scrotum of the rabbit There was at first local infiltration and oedema followed by sclerosis and ulceration, and finally cicatrization. The lesions behaved in all respects like those produced by *S. pallida.*

C. M. W.

LAIGNEL-LAVASTINE, BOUTET, SERRANT & ARBEIT. **Un cas typique de Sodoku à Paris.**—*Bull. et Mém. Soc. Méd. Hôpit. de Paris.* 1924. Feb. 7. Year 40. 3rd Ser. Vol. 48. No. 4. pp. 105–109. With 1 chart. [5 refs.]

A typical case of rat-bite fever in Paris. The organism was isolated from the blood by inoculation of mice.

C. M. W.

INFECTIOUS JAUNDICE.

GULLAND (G. Lovell) & BUCHANAN (George). **Spirochaetosis ictero-haemorrhagica in East Lothian.**—*Brit. Med. Jl.* 1924. Feb. 23. pp. 313–314. With 4 figs.

An outbreak of Weil's disease occurred amongst the coal miners of East Lothian, the first cases being noted in April or May 1923. The patients have been almost entirely young coal miners employed in different pits, the earlier cases coming from one pit, the later ones from another. One farm labourer, however, contracted the disease. In all about 18 cases have occurred. The affected pits were wet and rats were numerous. Clinically the cases were typical of the disease, and the organism isolated from the urine of one of the cases and from pit rats showed that both behaved in guinea-pigs like typical *Leptospira icterohaemorrhagiae.*

C. M. Wenyon.

HOFFMANN (W. H.). **Die markige Schwellung der Darmfollikel bei der Leptospireninfektion.** [Swelling of the Intestinal Follicles in Leptospira Infection.]—*Muench. Med. Woch.* 1924. Apr. 4. Vol. 71. No. 14. pp. 428–429. With 1 text fig.

The author has noted that in Weil's disease, both in human beings and in experimentally infected animals, there is marked swelling of the lymph follicles of the intestine. It bears a resemblance to that occurring in typhoid fever. Whether this condition occurs only in Weil's disease or will be found in other leptospira infections also, further investigations will show.

C. M. W.

HIETA (Kentaro). [**On the Pathological Changes of the Liver and the Development of Jaundice in Spirochetosis Icterohemorrhagica.**]—*Namman Igakkwai Zassh'* (*Jl. of S. Manchurian Med. Soc.*). 1923. Dec. Vol. 12. No. 2. [Summarized in *Japan Med. World.* 1924. Apr. 15. Vol. 4. No. 4. p. 99.]

From a histological examination of the liver from 19 cases of Weil's disease the following changes were noted. Though the liver was not much enlarged the hepatic stroma appeared turbid and the hepatic cells swollen. The cell bundles appeared to be irregular, while the hepatic cells lost their attachments. The nuclei of the cells were swollen, while the chromatin network was obscured and the chromatin dissolved. Every transition between dilated and undilated capillaries was found. The jaundice which occurs in the disease is thought to be due to the separation of the hepatic cells, which permits the bile to enter the blood stream.

C. M. W.

ODA (Toshiwo). [**Experimental Observation on the Acute Insufficient Blood Circulation which is met with in Spirochetosis Icterohemorrhagica.**]—*Tokyo Igakkwai Zasshi* (*Jl. of Tokyo Med. Soc.*). 1923. July. Vol. 37. No. 7. [Summarized in *Japan Med. World.* 1924. Jan. 15. Vol. 4. No. 1. p. 16.]

By noting that the rate of death due to suffocation is more rapid in animals suffering from experimental Weil's disease than in normal animals, the author concludes that the heart function is greatly obstructed in this disease.

C. M. W.

HOFFMANN (W. H.). **Estudio clinico de la enfermedad de Weil.**—*Rev. Med. y Cirug. de la Habana.* 1924. Mar. 25. Vol. 29. No. 6. pp. 176–182. [1 ref.]

A short paper on the symptomatology of Weil's disease not adding any new information.

C. M. W.

YELLOW FEVER.

FOWLER (James Kingston). **Yellow Fever in Gibraltar in 1804.**—*Jl. Roy. Army Med. Corps.* 1924. June. Vol. 42. No. 6. pp. 401–413. [2 refs.]

As a result of the examination of a manuscript entitled " Reports Relative to the Diseases of Gibraltar " by W. W. FRASER, Deputy Inspector of Hospitals, the author has come to the conclusion, apparently with ample justification, that a disease introduced into Gibraltar by a smuggler who died on August 10th or 12th 1804 was yellow fever. The disease spread to the civil population and thence to the garrison, which at that time was at a strength of 4,052. The civil population was probably about 9,000. Between the beginning of September, when the epidemic got a hold on the population, and the latter days of December, when it became extinct, there were 5,946 deaths. After the epidemic had ceased only 28 adults could be discovered who had resided within the walls and had escaped the infection. At about the same time the disease appeared at Algeciras with a similar population, but owing to the energetic measures which were taken to combat it the experiences of Gibraltar were averted. Those who wish to consider the evidence on which the conclusions are based must read the entire article, which is a most interesting one. [See also this *Bulletin*, Vol. 15, pp. 286–7.]

C. M. Wenyon.

WANSTROM (Ruth C.). **Occurrence and Staining of *Leptospira icteroides* in Guineapigs inoculated experimentally, with a Study of the Lesion produced.**—*Jl. Infect. Dis.* 1924. Feb. Vol. 34. No. 2. pp. 110–116. With 3 plates. [7 refs.]

In inoculated guineapigs *Leptospira icteroides* occurs in all the tissues, especially where haemorrhagic areas occur. The organisms are found in greatest numbers in the liver, they are numerous in the kidneys and occur to a less extent in the spleen and lung. In other tissues they are more widely scattered. The marked fatty degeneration of the liver and kidney described by NOGUCHI and PERRIN was not noted. There was acute congestion of all the organs. It was most evident in the liver, kidney, spleen, lung and lymph nodes, while the liver and kidney cells revealed cloudy swelling. The heart muscle showed Zenker necrosis. Phagocytosis of leucocytes was fairly marked, while there was slight leucocytosis. The tissue changes were not as definite as in cases of yellow fever and did not differ from those of experimental Weil's disease.

The Warthin-Starry silver-agar stain was found to yield results as satisfactory as those obtained with *S. pallida*.

C. M. W.

NOGUCHI (Hideyo). **The Pfeiffer Reaction in Yellow Fever.**—*Amer. Jl. Trop. Med.* 1924. Mar. Vol. 4. No. 2. pp. 131–138. [8 refs.]

A positive Pfeiffer reaction obtained with the serum of patients recently recovered from a disease suspected of being yellow fever provides confirmatory evidence of the infection. A negative reaction, however, may be obtained with the serum of persons who have had undoubted yellow fever; hence a clinical diagnosis of this disease cannot be negatived because the reaction fails. The capacity of the serum to give a positive Pfeiffer reaction does not endure for long, so that the reaction gives no indication of the actual immunity which, in the case of genuine infections, persists for the remainder of life.

That *Leptospira icteroides* is the causal agent of yellow fever is borne out by the fact that in Brazil the serum of convalescents from yellow fever gave positive Pfeiffer reactions with strains of the organism isolated in Ecuador, Mexico and Peru, while it gave negative reactions with *L. icterohaemorrhagiae.*

C. M. W.

RENDÓN (Garcia). **[Procedimiento fácil de hacer el diagnóstico bacteriológico de la fiebre amarilla.]** [An Easy Method of Diagnosing Yellow Fever Bacteriologically.]—*R. Méd. Veracruzana.* [Summarized in *Rev. Española de Med. Cirug.* 1924. Mar. Vol. 7. No. 69. p. 155.]

3 cc. of blood from the suspected patient is inoculated into the peritoneal cavity of a guineapig. If in the course of three days or so the animal's temperature rises above 40° C., the leptospira can be cultivated from its blood. In a positive case the guineapig may die with subnormal temperature, when the "jaundice and all the haemorrhagic lesions described in human cases will be seen." If the patient is dead a portion of the liver and of the kidney should be ground in a mortar with normal saline and 2 cc. of the emulsion inoculated intraperitoneally into a guineapig and the animal observed as before. [The author naïvely adds: "The negative result of these observations does not warrant our rejecting the diagnosis of yellow fever."]

H. Harold Scott.

R. MED. VERACRUZANA. **[Obtención de los cultivos de Leptospira con el medio de Noguchi.]**—[Summarized in *Rev. Española de Med. Cirug.* 1924. Mar. Vol. 7. No. 69. pp. 155–156.]

To Ringer's solution with 2 per cent. agar melted and brought to 50° C. is added 1–1·5 cc. of sterile rabbit-serum. A few drops of blood taken from the heart of an infected guineapig are inoculated into each tube, the whole covered with 2–3 cc. of sterilized liquid paraffin and incubated at 37° C. In 8–10 days there is a growth of leptospira beneath the paraffin. Animals suspected of being reservoir hosts are caught and killed; portions of the liver, spleen and kidney are emulsified in normal saline and injected into the peritoneal cavity of young guineapigs and these are then kept under observation as described in the paper by Dr. RENDÓN.

H. Harold Scott.

FRÓES (João A. G.). **Etiologia da febre amarella—Contribução Brasileira ao esclarecimento desse arduo problema.**—*Brazil Med.* 1924. May 3. Year 38. Vol. 1. No. 18. pp. 245–253.

This paper, the substance of an inaugural address, is only of historical interest and traces the investigations into the etiology of yellow fever which have been conducted in Brazil and the various theories which were advanced to explain it down to the discovery of the leptospira by NOGUCHI.

C. M. W.

NOGUCHI (H.). **O leptospira icteroides.**—*Rev. Med.-Cirurg. do Brasil.* 1924. Apr. Vol. 32. No. 4. pp. 171–177.

A letter written to A. G. FRÓES in which NOGUCHI expresses his views on the nature of spirochaetes, especially with reference to *Leptospira icteroides.* The date 1914 is evidently a misprint, as a later date is quoted in the letter.

C. M. W.

SLEEPING SICKNESS.

VASSAL (J.). **Etudes sur la maladie du sommeil (Alima, Likouala, Bas-Oubangui).**—*Bull. Soc. Path. Exot.* 1924. Mar. 12. Vol. 17. No. 3. pp. 234–259. With 1 map.

The data recorded in this paper were accumulated during a tour made by the author extending over a period of two months. He had two hospital assistants and examined more than 13,000 natives. The results of the examination of the population are summarized in the following table :—

Nos.	Division by regions.	Subjects seen.	Number of cases.	Percentage.	Observations.
1	Banks of Congo and Bas-Oubangui ..	867	38	4·3	As well as 300 subjects seen with fifty suspects.
2	Mossaka and territory of Mossaka	1,661	83	4·9	
3	Region of Makona and Likouala Mossaka from N'Dolo ..	2,970	124	4·2	
4	Region of Etoumbi-Ololi Odzala ..	1,360	100	7·3	
5	Basin of Kouillou and Fort-Rousset ..	1,610	38	2·3	
6	Basin of Alima ..	4,822	92	1·9	
	Total ..	13,290	475	3·5	

The author discusses the various means of diagnosis and lays stress on the importance of gland puncture as a means of recognizing cases in the field.

The following conclusions are given :—

1. From 1st December 1922 to 2nd February 1923, in the regions of Likouala Mossaka and Alima, 13,290 natives were examined and 475 (3·5 per cent.) found to be infected with sleeping sickness : the sick were treated with 2 injections of atoxyl.
2. The benefit of prophylactic treatment will be extended all over the country.
3. The methods employed have been controlled and judged efficacious. The diagnosis by gland puncture and microscopic examination, although not applicable to the case of children of tender years, ought to continue to be used generally to the exclusion of all others.
4. The collaboration of public services and the utilization of native hospital assistants will help to meet the difficulty as regards the European staff and to reorganize the sections on a larger scale.
5. Rudiments of medical knowledge will contribute to the progress of hygiene in these countries.

W. Yorke.

HUERTA (Plácido). **Progresos de la tripanosomiasis humana en Fernando Póo.**—*Siglo Med.* 1924. Apr. 12. Year 71. Vol. 73. No. 3670. pp. 367–371.

In Fernando Po in 1909 Dr. PITTALUGA found only 9 cases of trypanosomiasis. Eight years later the author saw more than 80 cases in the hospital at Santa Isabel, and the number continued to increase during the Great War, many cases occurring amongst the soldiers. Returning in 1920 he found that the number of cases registered at the hospital during the year had risen to 150. In 1923 in a single month (July 15 to Aug. 14) 36 cases were seen. He calculates that of the indigenous population 50 per cent. infection is a low estimate, and that in the island of Santa Isabel alone there are probably about 1,000 cases. There is reason to believe that prior to 1898 trypanosomiasis was rife in Fernando Po, and the paucity of cases between that time and 1917 is ascribed to practical annihilation of the people. Re-establishment of agricultural activity brought in labourers from without, Glossina was present in very large numbers, the animals had constituted reservoir hosts, and the disease again made headway till it attained the high percentage mentioned.

H. Harold Scott.

YAKIMOFF (W. L.). **Sur la question de l'infection de l'homme par les trypanosomes.**—*Ann. Soc. Belge de Méd. Trop.* Brussels. 1924. Jan. Vol. 3. No. 3. p. 307.

At the end of the year 1914, one of the author's collaborators (Mlle. N. A. Z.) accidentally inoculated herself with 1 cc. of citrated blood heavily infected with *T. brucei* [the origin of the strain is not stated]. A week later her blood was inoculated into a mouse which died ten days later without becoming infected. The lady was in poor health during the following two weeks, but there was no rise of temperature and the blood remained negative. Since 1914 she has had typhus, recurrent fever, has been accidentally poisoned with morphia and sublimate, has been pregnant, and has suffered privation during the Civil War, but has presented no sign of trypanosomiasis. The case is contrasted with that of LANFRANCHI, who infected himself accidentally with *T. evansi.*

W. Y.

VANDERYST (Le R. P.). **Les diagnostics empiriques et scientifiques de la trypanose humaine en prophylaxie sociale.**—*Rev. Méd. et d'Hyg. Trop.* 1924. Mar. Vol. 16. No. 3. pp. 65–86. [8 refs.]

As the result of a lengthy discussion of the subject, the author reaches the following conclusions :—

The great anti-trypanosomiasis missions in Africa ought to be organized in a scientific manner.

The search for infected cases ought to be based not only on palpation of the cervical glands, but rather on all the other clinical symptoms which are observed in trypanosomiasis.

Pseudo-diagnosis based exclusively on enlarged cervical glands is without positive value.

Medical diagnosis based on all the clinical symptoms has a more or less great value when the cases suspected can be kept under observation for a long period. It is, however, inadequate as a fundamental method for a scientific mission.

Microscopic diagnosis is the only scientific method for the immediate diagnosis of sleeping sickness.

Every prophylactic mission should be based on this microscopic method of examination and no native should be classified among the infected if the microscopic examination of his blood and gland juice is negative.

W. Y.

BRUMPT (E.). **Le *Trypanosoma rhodesiense*. Faits et hypothèses concernant son individualité.**—*Ann. Parasit. Humaine et Comparée.* 1924. July. Vol. 2. No. 3. pp. 254–273. With 3 text figs. [25 refs.]

In this somewhat lengthy paper the author, after giving a description of the morphology, pathogenicity, transmission and reservoir of *T. rhodesiense*, discusses its relationship to *T. gambiense* and *T. brucei.* The following are the conclusions:—

1. Recent epidemiological researches show in the author's opinion that *T. rhodesiense* is a good species.
2. The classification of trypanosomes should be based on the summation of their characters, both morphological and biological.
3. The natural immunity of certain species of hosts to natural infection is a character of great value and constitutes in the absence of others an excellent criterion for identifying certain species. It is difficult to admit of the existence of rapid biological transformations of trypanosomes occurring, as it were, before our eyes, in Africa, during the last few years.
4. Mechanical transmission of the trypanosomes parasitic to man in Africa does not explain the gravity of certain epidemics, a gravity which depends in part—as do diseases not transmitted by intermediate hosts—on certain factors which constitute for the ancient authors the "genie epidemique," factors which we are still incapable of determining precisely, and also on the absence of immunity amongst populations newly subjected to infection.
5. Much remains to be studied concerning the epidemiology of sleeping sickness due to *T. rhodesiense* and to *T. gambiense.*
6. It would be interesting to repeat with these organisms the experiments on the geographical variations of virulence and on superinfection which the author has effected with *T. inopinatum* and with the leech *Helobdella algira.*

W. Y.

DAVEY (J. B.). **The Outbreak of Human Trypanosomiasis (*Trypanosoma rhodesiense* Infection) in Mwanza District, Tanganyika Territory.**—*Trans. Roy. Soc. Trop. Med. & Hyg.* 1924. Feb. 21. Vol. 17. No. 8. pp. 474–481. [4 refs.]

In September and October 1923 the author accompanied by Dr. MACLEAN, the medical officer in charge of the district, spent nearly one month in the Mwanza sleeping sickness area. Since the discovery of the outbreak by MACLEAN early in 1922, about 5,000 persons have been removed from the fly infested forest to fly-free localities and the principal roads cleared to a width of 100–200 yards on either side; these measures were practically completed in 1922. Cases of the disease and suspects have been isolated and treated in camps in fly-free country.

Davey considers that the disease has been endemic in the area for several years and thinks it extremely unlikely that the case diagnosed on 2 April 1919 was the first. He points out that it is significant that for at least four years a considerable number of cases of sleeping sickness escaped detection within 50 miles of a medical station. It is by no means improbable that sleeping sickness is present in other parts of the country; the history of the disease in Nyasaland shows that *T. rhodesiense* infection readily escapes observation and it has now been reported from a large part of the fly-infested game areas of that country.

Davey was much impressed with two facts which did not perhaps receive due emphasis in previous accounts [DUKE and SWYNNERTON, *vide* this *Bulletin*, Vol. 20, p. 309 and p. 311].

The first is that villages, in the usual meaning of the term, do not exist. The huts in ones, twos and threes are scattered over wide tracts of country. Each unit of one to three huts comprises a family party, and a number of units scattered over an area of several square miles makes up a village. In open country each unit has its euphorbia enclosure; when, as is often the case, the site of the village is one of the low hills capped with granite boulders, the units are disposed around its base. The abandoned villages visited in the fly area were of this type or consisted of separate units of two or three huts in a small clearing closely surrounded by bush. This segregation system must exercise a very distinct restraining influence on epidemic disease.

Secondly, the author was impressed by the abundance of wild game in the area. In the fly forest or thorn scrub the ground was seamed by the spoor of zebra, antelope, giraffe, etc., and there were everywhere complaints of the great damage done to the gardens by these animals in the wet season. The author suggests that the fact that SWYNNERTON found but little game was due to some quite temporary diminution in the localities visited by him. A pack of wild hunting dogs will scare all game away from a spot, and furthermore, at the time SWYNNERTON visited the area, the rains had not long ceased and hunting in the long grass must have been very difficult. Davey cannot for a moment accept SWYNNERTON'S hypothesis that owing to scarcity of game the fly was driven to feed on man, nor does he consider that the proposed experiment in game destruction has for practical purposes been carried out in the area.

With reference to the effect of the preventive measures adopted, Davey states that in 1922 MACLEAN diagnosed microscopically 42 cases; these include only a few of the 37 diagnosed by DUKE at the sleeping sickness camps. Owing to pressure of work some cases died before MACLEAN examined their blood and in suspected cases treatment was often commenced before awaiting the confirmation of the diagnosis. Probably quite 50, including DUKE'S cases, died before diagnosis was confirmed by MACLEAN. In 1923, after removal of the forest villages to fly-free areas, 40 cases had been diagnosed up to 20 October, and probably there were at least nine other cases whose blood was not examined. It is certain that both in 1922 and 1923 a number of cases were never brought to notice, but probably, for several reasons, more escaped observation in the former year than in the latter. The diminution of the disease produced by removal of the population is not therefore very striking and makes caution necessary in accepting the doctrine of direct mechanical infection.

Information of considerable interest is given regarding the distribution of the cases. The 22 cases in Ntusu were drawn from 16 different villages; three cases came from one village, and two from each of four others; there were two cases from one village in Nunghu Sultanate; the remaining cases originated in separate villages. In no case could infection be definitely attributed to contact with another case, and now that all the villages have been removed from the forest it must be comparatively seldom that opportunity for direct infection by mechanical transmission can arise.

The author was much struck by the fact that large herds of cattle were grazed in what appeared to be dangerous proximity to the forest; it was said by the sultans that no sickness resulted nor did the author find a single instance of infection by blood examination.

The history of many cases shows that, for some time after infection, it is possible for long journeys to be made by the victim. Following the initial attack of pyrexia, there is frequently a period of 4, 6, or even more weeks when acute symptoms are absent and the patient is able to follow his ordinary pursuits; as the blood is then rich in trypanosomes, it appears that the part played by such persons in infecting the fly may have been underestimated. Davey considers that the progress of the outbreak in Mwanza district throws some light on the question of the relative importance of infected man and game as sources of infection. If infected man is the chief or only culprit, isolation of the cases in fly-free areas should have produced a more striking effect on the course of the outbreak than has been the case. If mechanical transmission only is at work, the effect of this measure should have been almost instantaneous.

Summary and Conclusions.

"1. *Origin of the Outbreak.*—The outbreak was almost certainly in full swing before the famine of 1919–20. It is more probable that infection was derived from game than that it was introduced by invading military units at a later date.

"2. *Method of spread.*—Infection is acquired from the tsetse in the forest. Whatever may have been the case early in 1922, the evidence of 1923 all points to transmission by cyclically infected flies.

"3. *Game and Fly.*—There is ample evidence that game is, and has for years been, comparatively plentiful in the area. The hypotheses are untenable that (i) the fly has been consistently driven to feed on man owing to scarcity of game, and (ii) the oft-demanded experiment in game destruction has been practically carried out in the area.

"4. *Source of infection.*—The probable importance of infected man as a source of infection of the fly in sleeping sickness areas has been underestimated. The relative importance of men and infected game in this respect is problematical.

"5. *Distribution of* T. rhodesiense *infection.*—The outbreak is another link in the chain of evidence that wherever game infected with the *brucei*-type of trypanosome fly of the *morsitans* group and man are brought into sufficiently close contact, cases of human infection will arise; they may escape detection for years.

"6. *Cultivation of the soil* is the only radical preventive of tsetse-fly and trypanosomiasis in Africa. The proximity of numbers of wild game is inimical to cultivation.

"7. *The facts which are known* regarding the Mwanza outbreak do not, in any way, invalidate the general conclusions on *T. rhodesiense* infection of man reached by the Royal Society's Scientific Commission to Nyasaland."

W. Y.

ARCHIVOS BRASILEIROS DE MEDICINA. 1924. Jan. Vol. 14. No. 1. pp. 52–88.—**A doença de Chagas. Parecer da Commissão da Academia Nacional de Medicina, constituida pelos Drs. Alfredo Nascimento, Henrique Duque, A. MacDowell e Moreira da Fonseca, sobre questões referentes á doença de Chagas, lido na sessão de 29 de Novembro de 1923. Informações prestadas pelo Dr. Carlos Chagas á Academia de Medicina.** [Report of the Commission appointed to consider the Question of Chagas's Disease.]

Doubt having been cast upon the work of Dr. Carlos CHAGAS relative to American trypanosomiasis by certain members of the National

Academy of Medicine of Brazil, some regarding the trypanosome as a harmless accidental blood-parasite, others not only denying the existence of such a condition but impugning the bona fides of Dr. CHAGAS, a Commission was appointed to make enquiries into the matter. They have not cleared up the question altogether, but have come to certain conclusions, the most important of which are:—1. That there is a definite morbid entity associated with the presence of *Trypanosoma cruzi* in the peripheral blood in acute cases. 2. That in so-called chronic forms the parasite may not be found either in life or in the tissues after death, but that this fact does not disprove its presence, and that further, more minute search may discover it. 3. As regards special forms of chronic cases—the cardiac and myxoedematous in particular—in one case of the former in whose blood the trypanosome had been found during life the finding was not confirmed at the autopsy, and the condition of myocarditis was indistinguishable from a syphilitic process, though it is acknowledged that in Chagas's disease the Wassermann reaction is negative and antisyphilitic treatment is unavailing. The whole question of goitre, myxoedema, and corresponding forms of American trypanosomiasis needs reconsideration, the Commission deciding that the areas in which the diseases occurred in some instances coincided, but whether there is any actual causal relation between the trypanosome and the thyroid condition was not proven.

In the latter part of the report Dr. Chagas's reply is given *verbatim* and consists practically of an amplified statement of the points found in all modern text-books on tropical medicine relative to this disease. [The reviewer is of opinion that this article would have been of greater scientific value and would have added more to the dignity of the Society had the editor seen fit to expunge the personal and vituperative parts of the letters which passed between the protagonists.]

H. Harold Scott.

CHAGAS (Carlos). **Sobre a verificação do "Trypanosoma cruzi" em macacos do Para,** (*Chrysothrix sciureus*). **Nota previa.** [*Trypanosoma cruzi* in Monkeys in Pará.]—*Sciencia Medica.* Rio de Janeiro. 1924. Feb. 29. Vol. 2. No. 2. pp. 75–76. With 1 plate.

——. **Infection naturelle des singes du Para** (*Chrysothrix sciureus, L.*), **par** *Trypanosoma cruzi.*—*C. R. Soc. Biol.* 1924. Apr. 4. Vol. 90. No. 12. pp. 873–876. With 4 text figs.

Whilst examining the blood of Para monkeys (*Chrysothrix sciureus*) parasites having the morphology of *Trypanosoma cruzi* were encountered. The infection was never intense in the monkeys, but young dogs proved very susceptible and died in a short time. Histo-pathological examination showed lesions similar to those found in man. Inoculation of guineapigs also succeeded, but the development of the infection was slower than in the dog.

In south Brazil the natural reservoir of the trypanosome is the Tatou (*Tatusia novemcincta*) and the intermediate host is *Triatoma geniculata*, and in north Brazil, where the human disease is as yet unknown, the parasite has been found in a monkey, but it is still to be determined whether the infection is pathogenic in monkeys and what is the intermediate host. The author considers that the parasite found by him in Para monkeys is not identical with *T. prowazeki* described by GONDER and BERENBERG-GOSSLER from the blood of *Brachiurus calvus* in the valley of the Amazon.

W. Y.

BLANCHARD (M.) & LAIGRET (J.). **Résultats éloignés du traitement de la maladie du sommeil par les fortes doses d'atoxyl. Traitement curatif et atoxylisation prophylactique.**—*Ann. Inst. Pasteur.* 1924. June. Vol. 38. No. 6. pp. 460–469. [3 refs.]

Treatment of human trypanosomiasis in the first stage has been profoundly modified at Brazzaville during the past few years by the employment of large doses of atoxyl instead of small or moderate doses. Atoxyl treatment in large doses takes two different forms: (1) at Brazzaville and in large centres the cure is prolonged for 6 weeks and has for its object a definite sterilization; (2) in the bush large numbers of patients are treated by 2 injections at 15 days' interval with the object of producing temporary sterilization of the blood and of so arresting the progress of the epidemic. The results obtained by these two methods are contrasted in the present paper.

Curative treatment. The treatment by massive doses of atoxyl practised at Brazzaville consists in giving 6 subcutaneous injections each of 1·5 to 2 cgm. per kilo of body weight. Actually the dose is almost always 2 cgm. per kilo and frequently exceeds this. The injections are given at 14 day intervals; generally the patient received 5 intravenous injections of emetic between the doses of atoxyl, but this had no effect on the result. In considering the results, only those are counted who received the above treatment only and again only those whose cerebro-spinal fluid contained less than 20 cells per cmm. and less than 0·2 gm. of albumen per litre. Of the 100 cases thus treated 6 relapsed during the first year. In the second year a certain number of cases progressed to the second stage of the disease; these formed 27 per cent. with 5 deaths; after three years 67 remained apparently in good health.

Prophylactic treatment. This method consists in administering two injections of atoxyl each of 1 to 1·2 gm. for an adult (about 2 cgm. per kilo of body weight) at an interval of 10 to 15 days, and if possible repeating it twice in a year. In the results given below only cases similar to those described above are considered. Of the 100 cases so treated 25 relapsed within a year; probably some were re-infections.

Table comparing the results of the prophylactic treatment and the therapeutic treatment.

1.—Prophylactic results.

	2 Atoxyl. per cent.	6 Atoxyl. per cent.
3 months after treatment:		
Relapses	6	1
Sterilizations	94	99
6 months after treatment:		
Relapses	17	3
Sterilizations	83	97
9 months after treatment:		
Relapses	20	6
Sterilizations	80	94
1 year after treatment:		
Relapses	24·5	6
Sterilizations	75·5	94

II.—Curative treatment.

After the first year results were:	2 Atoxyl. per cent.		6 Atoxyl. per cent.
Entered into second stage	6·5	..	4
Relapsed without meningeal reaction	22·5	..	6
Total of cases not cured	29	..	10
Number apparently cured	71	..	90

W. Y.

SICÉ (A.). **Notes résumées sur l'évolution, le pronostic, le traitement de la trypanosomiase, chez les indigènes du Gabon.**—*Bull. Soc. Path. Exot.* 1924. Feb. 13. Vol. 17. No. 2. pp. 179–191. [9 refs.]

This paper records observations made in the treatment of 217 cases of sleeping sickness treated between 12th August 1919 and 31st December 1920, and followed up to December 1921. The author divides the cases into four groups:—The first consists of 36 patients all in early stages of the disease. Details are given concerning 7 of these cases which can be considered as types. The cases received from 2 to 6 gm. of atoxyl and ·4 to 1·0 gm. of emetic and all were in excellent health and apparently cured at the end of the observation period. The second group comprised 104 cases also recognised and treated in the early stages of the infection. Details are given of six of these cases; all received several courses of atoxyl and emetic, and although all were in good state at the end of the observation period the prognosis is reserved. The third group consists of 41 cases concerning whom no information is available, and the last of 36 cases, all of whom died, notwithstanding energetic and prolonged treatment. These cases were in an advanced state when treated. Of the two types of cerebral cases described by MARTIN and DARRÉ, viz., the diffuse forms characterized by a meningeal syndrome with a subacute course, and the circumscribed form, the former was most commonly met with by the author. In conclusion the author lays stress on the importance of proper nourishment in the treatment of the patients.

W. Y.

LOW (George C.). **A Second Series of Cases of Human Trypanosomiasis treated by "Bayer 205." With an Account of the After-Histories of Some of the First Series.**—*Trans. Roy. Soc. Trop. Med. & Hyg.* 1924. Feb. 21. Vol. 17. No. 8. pp. 464–473. With 2 charts. [1 ref.]

Further information is given regarding the nine cases of sleeping sickness treated by LOW and MANSON-BAHR with "Bayer 205" [this *Bulletin*, Vol. 20, p. 323]. Six of the cases are well and have not received any further treatment, one relapsed and was treated with tryparsamide, and two are dead. Four further cases (*T. gambiense*) have been treated with the drug and details are given. The first of these had 12 injections of "Bayer 205"—each of 1 gm.—between 7th April and 30th June 1923; the second 10 injections between 27th June and 30th August 1923; the third 10 injections between 7th August and 10th October 1924; and the fourth, who had already had 3 injections before reaching England and whose blood was then negative, was given 10 injections between 24th October and 28th December 1923. All did well, but all developed albuminuria.

W. Y.

WALRAVENS (P.). **La maladie du sommeil dans la région de la Luvua. Traitement par le "Bayer 205."**—*Ann. Soc. Belge de Méd. Trop.* Brussels. 1924. Jan. Vol. 3. No. 3. pp. 223–231.

The author was sent by the Congo Government to join KLEINE'S Commission in order to study the therapeutic action of "Bayer 205." The district chosen had been studied during 1911–1914 by LEJEUNE, who found that about 6 per cent. of 25,000 examined were infected with trypanosomiasis. LEJEUNE had commenced an active campaign against the disease, but it was interrupted by the War. The disease has far from disappeared in the region. A table is given showing the rate of infection found in the different groups of villages visited in the Luvua district and shows that of a total of 3,368 persons examined 336 had enlarged glands and trypanosomes were found in 92 (2·7 per cent.); this figure is, however, certainly below the actual figure, for reasons which are discussed.

Diagnosis was most frequently made by examination of fresh gland juice, but sometimes parasites were found only after several punctures. In certain very suspicious cases there were no glands and in these trypanosomes were often found by examination of thick blood films, a method for making which is described.

The author reached the following conclusions regarding the endemicity of human trypanosomiasis in the Kiambi region:—

(1) The disease raged always with intensity, causing an unequally high proportion of patients in the places visited.

(2) The symptoms were severe and the mortality is probably high, 3 of 73 patients observed dying within two months.

(3) A considerable proportion of children between 6 and 15 years of age were infected. The author's attention had been frequently drawn to the comparatively small number of children met with in certain villages: this he ascribes to trypanosomiasis.

The drug was given intraveneously, 3 injections in relatively early cases and 4 in advanced cases. Injections were given according to the following plan, 1 gm. being given to adults and ·5 gm. to children:—

1st day; first injection.
3rd day; second injection.
5th day; third injection in severe cases.
13th day; third injection in early cases.
15th day; fourth injection in severe cases.

The results of treatment have been especially apparent in advanced cases and it is remarkable how quickly they have improved physically, but in patients suffering from mental symptoms the improvement has been less noteworthy; of four demented cases exhibiting great excitation two have become calm but remain incoherent, one is slightly improved and the last is unchanged. Trypanosomes disappeared from the blood and gland juice in all cases, usually in less than 48 hours, and a month after cessation of treatment all were still negative. The author adds that it is of importance that these cases be followed up, as it is only after 6 to 12 months or more that we can talk of definite cures.

As illustrating the beneficial effects of the drug in patients in a late stage of the disease, the author quotes the case of a woman who could not walk without support and in whom the prognosis seemed hopeless.

A month after commencement of treatment the patient was able to walk alone, has gradually recovered her strength, and is now in a state of convalescence. She had trypanosomes in the gland juice and in the spinal fluid before commencement of treatment.

In another very advanced case, however, who had four injections of "Bayer 205," scanty trypanosomes were found in the spinal fluid 3 weeks after cessation of treatment. This is comparable with a number of observations made by KLEINE in Rhodesia. The author concludes that "Bayer 205" is a very active trypanocide, which cures in probably 80 to 90 per cent. of cases and which sterilizes the peripheral vascular and lymphatic system in a still larger proportion of cases. It is hence of great value as a prophylactic in the regions where the disease is raging.

In conclusion, the author remarks that patients after treatment with the drug generally suffered from albuminuria, which persisted for a more or less prolonged period, often more than six months. In animals which were killed by large doses of the drug, degenerative lesions were noted in the liver and kidneys.

W. Y.

FONTANA (LUC). **Résultats statistiques du traitement de la trypanose humaine par le Bayer 205.**—*Arch. Méd. Belges.* 1924. Apr. Vol. 77. No. 4. pp. 271-273.

The author gives later information of the cases treated by KLEINE at Kiambi in the Tanganyika-Moero district. Those which relapsed did so between the sixth and twelfth months, and the last six months of the year 1923 will in all probability give an estimate of the exact value of the drug. Of the 83 cases treated during the first six months of 1923, 65 were in the first stage of the disease and 18 in the second with altered cerebrospinal fluid. Of the former, 51 are probably cured, 8 have relapsed and 8 are dead. The author remarks that the average time for reappearance of trypanosomes in the blood after the last injection of Bayer 205 was 226 days and the minimum time 145 days. He concludes that if Bayer 205 has not fulfilled all the hopes raised, nevertheless it is a drug of great value in virtue of the long period of sterilization of the peripheral blood which it produces.

W. Y.

BLANCHARD & LEFROU (G.). **Essais du stovarsol dans la trypanosomiase humaine.**—*Bull. Soc. Path. Exot.* 1924. Mar. 12. Vol. 17. No. 3. pp. 214–216. [2 refs.]

The therapeutic action of stovarsol (acetyloxyaminophenyl arsenic acid) was tested on eight natives suffering from the first stage of trypanosomiasis, *i.e.*, with normal cerebrospinal fluid. It was found that in order to sterilize the circulation by a single oral administration it was necessary to give 2·5 to 3·0 gm. of the drug; this dose was well borne and did not give rise to any trouble. The sterilization thus obtained was of short duration. The repetition at 24 hour intervals of smaller doses gave no better results. The authors conclude that stovarsol is not likely to play much part in the treatment of sleeping sickness, but the results are interesting, as it is the first example of a drug administered by the mouth having a definite trypanocidal action.

They mention that 189 or oxyaminophenylarsenic acid, which acts well in experimental infections of mice and guineapigs when given orally in doses even as large as 9 gm., has no sterilizing action on human beings, whereas 190 or stovarsol, a drug which has only a very moderate trypanocidal action in the case of infected mice and guineapigs, exerts, on the contrary, a quite definite action when given orally to infected human beings.

W. Y.

BLANCHARD (M.) & LAIGRET (J.). **Sur quelques cas de guérison de la trypanosomiase humaine à la deuxième période.**—*Bull. Soc. Path. Exot.* 1924. May 14. Vol. 17. No. 5. pp. 368–372.

At the Loanda Congress one of the authors and LEFROU recorded briefly a case of sleeping sickness which at the time of treatment with large doses of novarsenobillon was in the second stage of the disease and which had been observed for more than five years, during the last three of which the patient had been perfectly well ; repeated examinations of the blood were negative and the cerebrospinal fluid was absolutely normal. Since the Loanda Congress the authors have succeeded in obtaining at the Pasteur Institute of Brazzaville details of three other cases of a similar kind. Details of these four cases are given. The first case was a child of 12 years of age, recognised as infected in December 1918, and treated by small doses of atoxyl. In April 1920, 6 large injections of atoxyl were given, there was no relapse, but lumbar puncture made in January 1921 revealed trypanosomes in the spinal fluid. On 15th January she was given ·2 gm. of novarsenobenzol and this was followed by severe but transient symptoms of arsenical poisoning ; 12 days later a second injection of ·15 gm. was given. Six months later blood and spinal fluid were negative and normal and they have remained so up to January 1924, the child having enjoyed perfect health. The other cases are of a similar nature, but were adults and were treated by atoxyl.

The next question which arises is whether cases in the second stage of the disease ever recover spontaneously. Details are given of a case which seems to bear on this point. The patient was recognised as infected in 1911 and diagnosed clinically as in the second stage of the disease on account of the following symptoms : Tremors, loss of equilibrium, oedema of the face, a very poor general condition ; lumbar puncture was not permitted. Up to July 1911 he was given a course of treatment with the emetic of aniline. The blood was rendered negative, but the nervous symptoms increased and in February 1912 the patient was given a course of atoxyl in relatively large doses. At the end of 1912 there was a relapse and two injections of arsenobenzol were given ; these caused sterilization of the blood, but no improvement in the meningeal condition. In April and October 1913 lumbar puncture showed trypanosomes in the spinal fluid. An attempt at intrathecal treatment with arsenobenzol was made. In June 1914 the patient was completely paralysed in the legs ; he remained in hospital in the same state until 1922, when he disappeared. In January 1924 he turned up walking with the aid of two sticks and in excellent general health ; lumbar puncture was refused. The authors state that it is certain that in this case the improvement could not have been due to any therapeutic influence.

The conclusion is that in exceptional cases human trypanosomiasis well advanced in the second stage evolves towards a state which can be regarded as equivalent to a complete cure.

W. Y.

VAN DEN BRANDEN (F.). **Durée de la guérison apparente chez quelques anciens trypanosomiés traités.**—*Ann. Soc. Belge de Méd. Trop.* Brussels. 1924. Jan. Vol. 3. No. 3. pp. 359–363.

During the author's last sojourn at Stanley-Pool, he has had occasion to re-examine a number of old cases of sleeping sickness treated by BRODEN, RODHAIN, DUBOIS, MOUCHET and himself. The population of Leopoldville and Kinshara is an agglomeration of all the races of the Congo and is in a state of constant flux; hence it is difficult to follow cases for many years. This explains the comparatively small number of cases followed over prolonged periods. All the patients had normal spinal fluid and were in the first stage of the disease at the commencement of treatment. Details are given regarding 18 of these old standing cases, which are apparently cured after an average of 9 years and 9 months after cessation of treatment.

W. Y.

MORGENROTH (J.) & FREUND (R.). **Ueber die Wirkungsweise von "Bayer 205" bei der experimentellen Trypanosomeninfektion der Maus.** [The Mode of Action of "Bayer 205" in Experimental Trypanosomiasis of the Mouse.]—*Klin. Woch.* 1924. Jan. 8. Vol. 3. No. 2. pp. 53–55. [7 refs.]

Reference is made to the observations of MAYER and ZEISS on the difficulty of obtaining in the mouse a strain of trypanosomes resistant to "Bayer 205" [this *Bulletin*, Vol. 17, p. 334] and also to the fact that KLEINE and FISCHER readily obtained "Bayer 205" fast strains of *T. brucei* in monkeys and in cattle [*loc. cit.*, Vol. 21, p. 56]. Freund succeeded, after prolonged experiments, in obtaining in mice a highly and persistently "Bayer 205" resistant strain of nagana (strain Prowazek) and it is remarked that this strain was also resistant to trypanblue.

Morgenroth and Freund could not repeat MAYER and ZEISS's method of treatment and relapse, as with the nagana strain used by them relapses never occurred after treatment with "Bayer 205," although they were observed in the use of other drugs. Cure was obtained by subcutaneous injection of ·5 cc. of 1 : 10,000 solution of the drug per 20 gms. of body weight in mice, trypanosomes disappearing after a day or two and never reappearing; even ·17 cc. of the above solution sometimes caused a disappearance of trypanosomes and in one case there was no relapse. From these observations the authors conclude that not only has "Bayer 205" a trypanocidal action, but also that it is capable of influencing the growth of relapsing strains. In order further to investigate the subject, it was necessary to eliminate the trypanocidal action of the drug and to allow that part of the work to be done by another drug. The drug chosen for this purpose was tartar emetic, the primary trypanocidal action of which was regularly followed by a relapse.

Mice were injected subcutaneously with ·3 cc. of diluted mouse blood containing 1 to 2 trypanosomes per microscopic field and at the same time ·5 cc. of a 1 : 20,000 solution of " Bayer 205 " per 20 gms. of body weight was injected intraperitoneally. Some of the mice did not receive the drug and served as controls. Details of one of many similar experiments are given in a table. All the mice became infected, and when the infection was sufficiently advanced all the animals were given ·3 cc. of 1 : 1,000 solution of tartar emetic per 20 gms. of body weight. The mice which previously received the " Bayer 205 " did not relapse after the tartar emetic, whereas controls did. In further experiments it was found that when the dose of " Bayer 205 " was reduced to ·5 cc. of a 1 : 40,000 per 20 gm. of body weight, relapses occurred. These experiments show that although " Bayer 205 " in the doses given exerts little or no prophylactic power over the infection, it nevertheless influences to a considerable extent the ultimate effect of the tartar emetic, which is qualitatively changed, inasmuch as the otherwise invariable relapses do not occur. The treatment of trypanosome infections with exceedingly small doses of " Bayer 205 " influences in a quite specific manner one of the functions of the trypanosome cell, viz., its power to become serum resistant, this function being crippled.

Reference is made to previous work of Morgenroth and ROSENTHAL,* who showed that a tantalum compound, although it did not influence the course of the infection, nevertheless caused the blood of the infected animal when injected into a susceptible one to be non-infective. Morgenroth and Freund also proved that the above-mentioned " Bayer " resistant strain was also resistant to this secondary action of the drug, as it relapsed after treatment with tartar emetic.

This work, the authors consider, emphasizes the importance of combined therapy in the treatment of trypanosomiasis.

W. Y.

KRITSCHEWSKY (J. L.) & BRUSSIN (A. M.). **Von der Wirkung hypertoxischer Dosen Salvarsan auf salvarsanfeste Trypanosomenrassen in Verbindung mit der Frage von der Pathogenese der Schlafkrankheit und der Parasyphilis.**—[On the Effects of Hypertoxic Doses of Salvarsan on Salvarsan-fast Trypanosome Strains in relation to the Pathogeny of Sleeping Sickness and Parasyphilis.]—*Ztschr. f. Immunitätsf. u. Experim. Therap.* I Teil. Orig. 1924. June 2. Vol. 39. No. 6. pp. 513–549. [22 refs.]

The authors have found that if salvarsan is injected subcutaneously in acid solution doses are tolerated 3–6 times as great as those in alkaline solution.

The following summary is given :—

1. The organotropy of salvarsan to the skin and subcutaneous tissue and the possibility, demonstrated by us, of a simultaneous organotropy and parasitotropy have shown us the means of introducing into an organism doses of salvarsan which are several times as large as the doses hitherto employed.

2. It was clear that the possibility of " hypertoxic " doses would be of great importance in therapeutics. An attempt was therefore made to sterilize a salvarsan-fast organism.

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* Summarized at some length in *Sleeping Sickness Bulletin,* Vol. 3, pp. 115 & 301.

3. The possibility has been demonstrated of destroying salvarsan-fast trypanosome strains in the same organism in which they acquired their resistance.

4. After a treatment with "hypertoxic" doses 12·5 per cent. of the mice infected with salvarsan-fast trypanosomes had been sterilized (carefully controlled).

5. In animals, in which the salvarsan-fast strains could not be completely destroyed, "hypertoxic" doses showed the following results: In 99·12 per cent. a remission occurred (in animals treated with an alkaline salvarsan solution only 59·2 per cent.); in the majority of cases this remission occurred within 24 hours (70·3 per cent.), 28·5 per cent. on the second day and 12 per cent. after 48 hours. In animals treated with the alkaline solution the remission hardly ever lasted more than 8 days, in those treated with "hypertoxic" doses an 8-day remission was a rarity; it usually lasted much longer, often as long as 2 months.

6. Mice from the organism of which salvarsan-fast trypanosome races do not disappear after one treatment with "hypertoxic" doses can be sterilized by a second treatment, or else their remission period lengthened.

7. A hypothesis is suggested to explain the lack of success in the treatment of sleeping sickness by drugs, and for the appearance of parasyphilis, as the result of a formation in the human body of drug-fast trypanosomes and spirochaetes.

8. Observations were made on the customary doses of salvarsan and on the possibility of increasing them.

W. Y.

MIGNOLI (Alfonso). **Del comportamento della tripanocidiasi in diverse forme morbose.**—*Riforma Med.* 1924. June 23. Vol. 40. No. 25. pp. 577–579. [13 refs.]

LAVERAN and MESNIL noted the trypanocidal action of human serum on *T. brucei*, and further, that, though the maternal serum possessed this power, that of a new-born child had none. Following this up the author tried the trypanocidal effects of human sera in various diseases. Apparently the property is peculiar to human serum, that even of anthropoid apes being inert; he does not agree that it is attributable to the leucocytes, since it was not diminished by the existence of a leucopenia; also that it is not due to complement action because inactivation of the serum did not affect the result. He is of opinion that it is hepatic in origin and is diminished when the function of the liver is disorganized. He inoculated a large number of rats with *T brucei*. All showed infection within 48 hours and controls died in 2–3 days. To the others was given 0·2 cc. serum for every 20 gm. of body weight. Sera were tried from 25 patients, among whose maladies were tuberculosis in various stages, carcinoma of the head of the pancreas with marked jaundice, pancreatic diabetes, catarrhal jaundice, bronchopneumonia, enteric fever, encephalitis lethargica, cardiac valvular affections, and so on. He found that serum from a case of advanced tuberculosis was less trypanocidal than that from an early or improving case, that the presence of malignant disease did not affect the trypanocidal action, but that liver conditions altered it in the degree to which the liver cells were injured by disease.

H. Harold Scott.

LLOYD (Ll.) & JOHNSON (W. B.). **The Trypanosome Infections of Tsetse-Flies in Northern Nigeria and a New Method of Estimation.**—*Bull. Entom. Res.* 1924. Mar. Vol. 14. Pt. 3. pp. 265–288. With 3 plates & 6 text figs. [15 refs.]

The authors point out that in studying the relationship of tsetse flies to the wild fauna a rapid method of estimating the trypanosome infections of the flies is of great utility. Between September 1921 and April 1922, 2,500 tsetses comprising 448 *G. morsitans*, 1,497 *G. tachinoides* and 534 *G. palpalis* were dissected and fully examined, all the organs containing flagellates being permanently mounted. The slowness of this method is its chief drawback, as not more than 40 flies could be dealt with in one day. The first attempt at a more rapid method of examination was made by collecting from each fly before dissection the small drop of salivary exudate which can be expressed from the tip of the proboscis by slightly squeezing the insect. The numbers of mature infections (infective forms) of the *T. vivax* and *T. congolense* groups discovered by dissection were :—in *G. morsitans* 44, in *G. tachinoides* 33 and in *G. palpalis* 9, whereas the number which could have been discovered if the salivary exudate only had been examined were 22, 10 and 9, respectively.

Since all infections of the *vivax* group and all mature infections of the *congolense* group are discoverable by examination of the proboscis alone a series of examinations of this organ was next carried out, and 3,458 *G. tachinoides* and 623 *G. morsitans* were thus examined in the last eight months of 1922, a few hours each week being devoted to the work. The objection to the method is that it does not reveal the mature infections of the *brucei* group, though some are found by it.

With regard to the development of *T. gambiense* in *G. palpalis*, the authors quote from Miss ROBERTSON as follows :—

> "The [salivary] gland [of the tsetse-fly], as is well known, is composed of (1) a narrow tubular part, which leads back to (2) a slightly broader cellular part, which in turn leads to (3) the glandular part where the full width of the organ is attained. The trypanosomes settle down and attach themselves in the second part of the gland or at the entrance to the third part, the rest of the gland being quite free from trypanosomes."

They add that later, of course, the whole gland is involved. In order to detect mature infections of the *brucei* group a method of dissection was evolved which yields the first two parts of the salivary glands. The rarity, however, with which trypanosomes were encountered makes the authors doubt whether none were missed. Of the seven mature infections of the group, viz., two *T. gambiense* and five *T. brucei* obtained in laboratory infected *G. tachinoides*, it was the authors' opinion that five could not have been missed by the rapid method of dissection, whereas two could not be detected in the fresh preparation of the whole gland, although trypanosomes were subsequently found in stained films.

By the above rapid method flies can be dealt with at an average rate of 50 or more an hour. All mature infections of the *vivax* and *congolense* groups and most infections of the *brucei-gambiense* group are discovered.

A description is given of the technique employed in the making of (1) The full dissection; (2) Proboscis dissections, and (3) Proboscis and salivary gland dissections; the procedure is well illustrated by six diagrams.

Identifications of infections.—The trypanosomes discovered were referred to their groups by a combined study of developmental and infective forms, while the position in the fly is an additional aid. Four species of pathogenic tsetse-borne trypanosomes occur in Nigeria, viz., *T. gambiense, T. brucei* (*T. pecaudi*), *T. congolense* and *T. vivax.* All four species were transmitted by the authors in the laboratory. *T. simiae* is not known to occur in West Africa nor has *T. rhodesiense* been recorded there.

T. vivax group.—The developmental forms in the labial cavity are all free-flagellated crithidia in compact fixed colonies; they are rarely truncated at the posterior end (compare *T. congolense* group). The pre-infective forms are crithidia with the blepharoplast and nucleus close together at the anterior end; they are free-flagellated and somewhat undulant. These forms invade the hypopharynx, and after an anterior movement of the nucleus become infective forms, which are slender, markedly undulant, free-flagellated, with a sharply pointed anterior end, and, in general, closely resembling the blood forms except for size, the average length being 14·4 to 14·9μ.

T. congolense group.—The site of development is the mid-gut, where only trypanosomal forms occur. The shorter forms are aflagellate. A longer free-flagellate form is produced which moves forward to the proventriculus and thence to the labial cavity. These forms are indistinguishable from the corresponding forms found in the *brucei-gambiense* group. In the labial cavity the organisms become aflagellate, or almost aflagellate crithidia, which are found in loose colonies. The individual crithidia are very frequently truncated at the posterior end. The only form in the proboscis which can be confused with *T. vivax* is a very slender free-flagellated form with the blepharoplast in close contact with the nucleus at the posterior end. This is probably in the pre-infective stage, as it was seen to invade the hypopharynx. The infective forms which are produced in great profusion are small, stumpy, aflagellate organisms with a blunt posterior end, feebly undulant, and closely resembling the smaller forms of *T. congolense* as seen in the blood; the average length is 11·1 to 11·2μ.

T. brucei-gambiense group.—The first phase of development occurs in the mid-gut, and the infection in this site can be distinguished from the *T. congolense* group by the fact that while the organisms of the latter species are almost aflagellate, those of *T. brucei* and *T. gambiense* are almost always free-flagellated. The completion of the gut development occurs when the proventriculus is invaded by long, slender, free-flagellated forms, indistinguishable from the comparable stage of *T. congolense.* Slender forms invade the salivary glands by way of the labial cavity and hypopharynx and become converted in the glands into short, broad, free-flagellated crithidia, which could not be distinguished from corresponding forms of *T. vivax,* except by the position in the fly. The infective forms have a blunt, posterior end and a more uniform width than those of *vivax* and the free flagellum is shorter. Transitional forms between the crithidia and the infective stage are common.

T. grayi.—This species is only recorded in the gut of the fly. It is at once distinguished from the foregoing species by the invariable presence of broad crithidial forms.

An analysis of the infections discovered by full dissection of the flies is given in a table.

The Trypanosome Infections found by Complete Dissection of Tsetse-flies in various Localities in N. Nigeria. All in Percentages.

Fly.		*G. morsitans.*	*G. tachinoides.*		*G. palpalis.*
			Wild ungulata common.	Wild ungulata very scarce.	
Number examined		448	1,093	404	534
T. vivax group	Mature ..	6·5	2·0	0·7	1·5
	Immature	12·3	5·6	1·0	1·1
	Total ..	18·8	7·6	1·7	2·6
T. congolense group	Mature ..	3·1	0·6	0·5	0·2
	Immature	5·1	1·3	0	0·4
	Total ..	8·2	1·9	0·5	0·6
T. brucei-gambiense group.	Mature ..	0	0	0	0
	Immature	0·4	0·2	0	0
	Total ..	0·4	0·2	0	0

The authors state that it was never possible to compare the three prevalent species of tsetse in any considerable numbers from the same locality; strict comparisons between *G. morsitans* and *G. tachinoides* were made several times and the results are given. A section is devoted to the prevalence of *T. grayi* in *G. tachinoides* and *G. palpalis* ; and the seasonal variation in infection, and comparison of infections in various areas, based on proboscis examination are discussed at some length.

The following summary and conclusions are given :—

"This paper has been written to describe a new method of rapid estimation of trypanosome infection in tsetse-flies and to show the possibility of obtaining important information by it rather than as a record of any knowledge which has been gained while it was being developed. By means of a dissection which yields the proboscis fully displayed and the important parts of the salivary glands in one preparation, all mature infections of the *vivax* and *congolense* groups of trypanosomes may be discovered and most of the *brucei-gambiense* group. It gives no information as to the pathogenicity of the parasites and does not serve to distinguish between such morphologically similar species as *T. brucei* and *T. gambiense.* These are great drawbacks, which can only be overcome by the use of elaborate fly-feeding experiments. Compared with these latter, however, it is a much less cumbersome method, and in the main as rapid, while it yields, within its limits, more accurate statistics. By these it is possible to study the infection in the fly in relation to animals with which it is in contact and in various ways light is thrown on the bionomics of the insect.

"The method is sufficiently sensitive to record at once the effect of any change in local conditions. An instance of this occurred at Mashiwashi, when the disturbance in a patch of dense forest due to building and a certain amount of fly-catching reduced the proboscis infection in one part from 18·3 to 4·1 per cent. within six weeks, to be followed by a corresponding rise after the disturbance ceased.

"There is an indication that in at least one of the pathogenic trypanosomes (*T. vivax*) an important seasonal variation in the proportion of infective flies (*G. tachinoides*) occurs, the mature infections increasing as the rains progress.

"Variations in the infections of *G. tachinoides* and *G. morsitans* in different parts of a very small area have been found by the proboscis examination. To have discovered this so fully by means other than quick dissection would have entailed carrying out a series of fly-feeding experiments from each of ten foci in the case of *G. tachinoides*, and from each of three fixed spots in the case of *G. morsitans*—an impracticable undertaking.

" A comparison of the infectivity of the three prevalent species of tsetse for the country generally is given. *G. morsitans* is much more heavily infected with the main cattle-inhibiting trypanosomes (*T. vivax* and *T. congolense*) than is *G. palpalis* or *tachinoides*.

" It is also shown that the infection in *tachinoides* is heavier in spots where the wild ungulates are prevalent than in places where they are scarce. Where *G. morsitans* and *tachinoides* range together the infection in the former is double, or more than double, that in the latter. This is probably because *G. tachinoides* has no special predilection for ungulates as hosts.

" Some notes on the non-pathogenic *T. grayi* are included, with evidence that it is reptilian in origin."

In an appendix details are given of certain transmission experiments with *G. tachinoides* of *T. vivax, T. congolense, T. gambiense* and *T. brucei.*

W. Y.

KLEINE (F. K.). **On a Recent Expedition to Africa to investigate the Action of " Bayer 205 " in Trypanosomiasis.**—*Trans. Roy. Soc. Trop. Med. & Hyg.* 1924. Feb. 21. Vol. 17. No. 8. pp 445–452. (Discussion pp. 452–463).

——· **Ueber meine Reise nach Afrika zur Prüfung von Bayer 205.** [On my Expedition to Africa to test the Action of Bayer 205.]—*Med. Klin.* 1924. Mar. 23. Vol. 20. No. 12. (1006.) pp. 367–369.

These papers are substantially the same as the one previously published and already noticed here [this *Bulletin*, Vol. 21, p. 56].

W. Y.

BULLETIN DE LA SOCIÉTÉ DE PATHOLOGIE EXOTIQUE. 1924. Apr. 9. Vol. 17. No. 4. pp. 288-290. [1 ref.]—**Prophylaxie de la maladie du sommeil.**

REVIEWS AND NOTICES.

BRITISH MUSEUM (Natural History). **Guide to the Mollusca exhibited in the Zoological Department, British Museum (Natural History).**—55 pp. With 47 figs. 1923. London: Printed by order of the Trustees of the British Museum. [Price 1s.]

Since pond-snails are the intermediary hosts by which the digenetic Trematodes are nurtured and disseminated, most medical men, in the tropics at any rate, want to know something about Mollusca; and in this well-illustrated "Guide" to the well-arranged and very complete collection of Mollusca exhibited in the galleries of the British Museum of Natural History they will find a large amount of useful information succinctly stated.

A. Alcock.

ROCKEFELLER FOUNDATION. **A Review for 1923. By George E. Vincent (President).**—48 pp. With 20 figs. & 1 map. 1924. New York.

"During the year 1923 the International Health Board, the China Medical Board, and the Division of Medical Education of the Rockefeller Foundation (1) supplied fellowship funds for 636 individuals in 29 different countries; (2) supported through the League of Nations interchange institutes for 54 public health officers from 27 nations; (3) arranged international visits of one commission and of 24 visiting professors; (4) furnished emergency relief in the form of medical literature or laboratory equipment and supplies to institutions in 15 European countries; (5) sent scientific material to Japan after the earthquake and invited a group of Japanese medical scientists to use the laboratories of the Peking Union Medical College as guests of the institution; (6) continued to contribute to schools or institutes of hygiene at Harvard, London, Prague, Warsaw, and São Paulo, Brazil; (7) co-operated in nurse training at Yale University and in France, Belgium, Brazil, China, and the Philippines; (8) accepted an invitation from Brazil to participate in a comprehensive attack upon yellow fever; (9) had a share in demonstrations of malaria control in 12 American States and conducted malaria surveys or studies in the United States, Brazil, Australia, Nicaragua, Porto Rico, Salvador, the Philippine Islands, and Palestine; (10) either continued or began antihookworm work in conjunction with 20 governments in various parts of the world; (11) contributed to 183 county health organizations in the United States, New Brunswick (Canada), and Brazil; (12) continued a study of the medical schools of the world by visits to Belgium, Austria, Czecho-Slovakia, Germany, Hungary, Poland, Turkey, Hongkong, the Straits Settlements, Siam, Canada, England, Scotland, Wales, the Netherlands, Mexico, and Colombia; (13) offered to contribute £280,750 sterling to the development of medical education in certain universities in the British Isles; (14) gave $500,000 to the University of Alberta, and pledged $250,000 to the University of Pennsylvania toward buildings for anatomy and physiological chemistry; (15) continued to support a modern medical school and teaching hospital in Peking; (16) aided two other medical schools and 25 hospitals in China; (17) assisted premedical education in several institutions in China and agreed to do this also in Bangkok, Siam; (18) lent representatives to governments and institutions for various types of counsel and service; (19) continued to support a disease reporting service of the Health Section of the League of Nations; (20) contributed to mental hygiene projects, demonstrations in dispensary administration, organization of dispensary work in France, and to other undertakings in the fields of public health and medical education."

A. Alcock.

TROPICAL DISEASES BUREAU.

TROPICAL DISEASES BULLETIN.

Vol. 21.] 1924 [No. 10.

SCURVY: A REVIEW.

By Surgeon Rear-Admiral Sir P. W. BASSETT-SMITH, R.N. (retired), K.C.B., C.M.G., F.R.C.P., F.R.C.S.

Sectional Editor, Tropical Diseases Bureau.

It was in 1920 that scurvy as a disease was given a separate heading in the *Tropical Diseases Bulletin*, and its inclusion was justified by the fact that as a consequence of the war and the hardships inseparable from it a truly enormous number of cases were reported from sub-tropical and tropical areas, particularly from the campaigns in Mesopotamia and Africa.

There is no doubt that within recent years our conception of scurvy has come to include much more than the old-fashioned type of ship's scurvy, important though this is. Year after year the close affinity of this disease with other diseases associated with a deficient food supply and inefficient metabolism has been demonstrated, for from true scurvy we pass in one direction to ship scurvy, Rand scurvy, and beriberi, and in the other direction we find infantile scurvy (Barlow's disease) merging into rickets. This more comprehensive and more interesting conception has led to an enormous amount of experimental work, with a plethora of papers of international range, offering light on etiology, etc. There are still some who bring forward evidence of an infective origin [PESCHIĆ (1923), MESSERSCHMIDT (1919), and LIND (1919)], but the deficiency theory of a want of vitamin C is most generally accredited, though, as shown by Hans ABELS (1919, 1920), McCARRISON (1920) and many others, a secondary intestinal infection may play a very important part. The more lengthy papers of VEDDER (1921, 1922), HOPKINS (1921) and HESS (1920,1921) on the etiology of the disease are all of great importance, particularly those founded on the clinical observations on hospital children by HESS, and those of the devoted workers at the children's clinic in Vienna (CHICK and DALYELL (1920), and others). Reports relating to the outbreak of scurvy in the European forces in Mesopotamia (over 11,000 cases) by WILLCOX (1920), HEHIR (1919), and SHEPPARD (1920), show how the disease was definitely dependent upon a faulty dietary often under excessive hardship and how recognized and cured, and describe the prophylactic measures adopted, such as the use of germinating beans and peas and the cultivation of vegetables in the occupied area. SHEPPARD showed how superior raw potato (as salad) was to the fresh prepared lime-juice received from Bombay, and the uselessness of ordinary West Indian lime juice is now well realized. In Africa MACVICAR (1920) showed that the incidence of scurvy was highest in natives, many of whom were often in a pre-scurvy condition on arriving at the Rand.

The outbreaks of scurvy in the latter years of the war and after, in Northern Russia, chiefly in the prisons, are vividly described by STEVENSON (1920), COMRIE (1920) and BIERICH (1919); they all teach that a history of previous debilitating disease or a condition of mental depression not only increases the incidence but also shortens the incubative period (from the usual 4 to 5 months to less than 3 months, even to 1 month) and confirm the great curative value of fresh lemon-juice, germinating peas, and fresh meat. In describing the extensive outbreaks of scurvy in Southern Roumania during the winter and the spring of 1918 NICOLAU (1919) emphasizes the occurrence of a papular haemorrhagic rash as a diagnostic sign in both pre-scurvy and developed scurvy cases; other early signs are swelling of the pinna [SHEASBY (1921)], night blindness with anaemia, pains, and bleeding gums [PICARD and LLOYD (1920)]. Among the Serbian troops WILTSHIRE (1919) observed in 87 per cent. of 3,000 cases a hyperkeratosis of the hair follicles. HESS (1920), in a survey of the Great War, shows how scurvy was present in the armies of all nationalities, except the American, who were in the field only a short time; frequently cases were not recognized, or were described as infective purpura, etc., but in the general shortage the various nutritional diseases due to want of particular food-factors became very difficult to discriminate, especially Barlow's disease or infantile scurvy, war oedema, and beriberi. Among the most noteworthy new methods of treatment is that of DONALDSON (1923), who injected intravenously strained orange-juice brought to a faintly acid reaction with NaOH (1 in 10) and diluted with normal saline. DONALDSON favours an initial dose of 10 cc. increasing by 5 cc. up to 25 or 30 cc. given daily or on alternate days. The Kaffir beer used in South Africa was believed to have little curative effect by VAN DRIEL (1922), though DELF (1921) and others have reported that the quickly fermented variety has some antiscorbutic power. The antiscorbutic value of tomatoes for prevention and treatment is of great importance, especially as it is not impaired by tinning. (HESS & UNGER (1919), BASSETT-SMITH (1921), GIVENS & MCCLUGAGE (1921).)

Infantile scurvy and Barlow's disease.—It is quite natural that the scurvy of infants has been a source of much investigation, for in times of privation infants are bound to suffer very severely (1) from unhealthiness of the mothers, (2) from insufficient food, often imperfect in quality and overcooked. In Vienna, as shown by CHICK & DALYELL (1919) and others, even in the hospitals where great attention had been directed to the hygienic surroundings and a sufficiency of calories in the daily diet (VON PIRQUET'S hospital), scurvy and associated rickets were very prevalent, but disappeared on an altered diet containing abundant antiscorbutic juices and fat-soluble vitamin.

WEILL & DUFOURT (1919) describe 9 cases in recently repatriated children which were diagnosed as enteritis and were rapidly cured by lemon juice. FABER (1921) suggests that the use of sodium citrate may destroy the antiscurvy properties of raw milk and quotes a case.

HESS and others have shown that the amount of antiscorbutic vitamin in raw milk, never very large, varies enormously with the condition and the feed of the cows from which it is obtained, as also does mother's milk from the same causes. GIORGI (1921), who found that in Italy among the breast-fed infants of the poorer classes the disease is uncommon, but is much more frequent in the middle classes, describes an epidemic of Barlow's disease (or latent infantile scurvy—which he considers to be pathologically identical) in Venice (1919–20), due to the supply of a specially prepared form of milk. This "milk of Soresina" was supplied in very large quantities from April 1918 to April 1920; it was not only insufficient in quantity for the returning population, but it was deficient as a food, and was undoubtedly the chief cause of the epidemic. He concluded from his experience that the infants of the very poor suffer most from inanition, rickets and scurvy, while in those of the better classes the condition is more that generally recognized as Barlow's disease. There is almost unanimity of opinion that the early replacement of mother's milk by proprietary preparations is one of the most fertile sources of infantile scurvy. THURSFIELD (1922) particularly condemns dried milk, which should always be supplemented with fresh orange-juice. The method of drying the milk is, however, of great significance. AIKMAN (1921), and MIYAKI in Japan, found that prolonged use of condensed, boiled, or pasteurized milk caused infantile scurvy, giving rise to latent, mild or severe types of the disease. A condition described as "alimentary anaemia" by ARON (1922) is often associated with scurvy or Barlow's disease; 7 out of 15 of his cases had scurvy signs, but whether the same factor is the cause of both he could not say; it is probable that the condition is due to deficiency of several vitamins and a secondary bacterial infection. The red cells may fall to 2 millions and the white be as high as 31,000.

From all these observations one sees that the old story is repeated. War and destitution increase the incidence of scurvy equally and impartially in adults and infants. The particular symptoms will vary in correspondence with the deficiency of particular vitamins other than C, and the symptom complex will show gradations towards beriberi or towards rickets accordingly. The use of artificial foods and sterilized milks may be potent causes of scurvy, more particularly in children, yet the beneficial action of the heat in destroying pathogenic organisms must be taken into account, and the attendant danger of scurvy must be obviated by the addition of antiscorbutic juices and by hygienic attention.

Experimental Work on Scurvy.—A large amount of research has been carried out, in many countries, but particularly in France, by MOURIQUAND and his collaborators (1920, 1922); in America, by HESS & UNGER (1919, 1921), and by GIVEN & MCCLUGGAGE (1919, 1921 *a* & *b*); and in England, by CHICK (1920), HUME (1921) and SKELTON, and by HARDEN & ZILVA (1920)—to mention only these. Investigation has been concentrated on the following problems:—(*a*) The essential nature and the keeping properties of the antiscorbutic vitamin; (*b*) the comparative value of antiscorbutic foods; (*c*) the prophylactic and curative application of such foods; and (*d*) pathological effects of deficiency, discrimination of inanition from starvation, hypovitaminosis and avitaminosis.

Vitamins, though variously described as catalysers, ferments, complements, etc., have not been isolated chemically. As regards the antiscorbutic vitamin C it is known to be a non-nitrogenous body (VEDDER (1921)), soluble in water, absolute alcohol, acetone, and commercial ethyl acetate ; it cannot be extracted from partially dried juice by ether, chloroform or carbon tetrachloride ; and, unlike vitamin B, it is not adsorbed by animal charcoal or precipitated by phosphotungstic acid. Its biological properties are better known, from animal experimentation. The agents most destructive to the vitamin are oxidation, alkalies, ordinary heat (though heating in vacuo or in an atmosphere of CO_2 causes little reduction of its efficiency [HESS & UNGER (1919, 1921), ZILVA (1921,1923)]), and keeping. If lemon juice is evaporated in vacuo at room temperature and made up in tablet form it retains its efficiency for guineapigs for a year, and such tablets should be useful in arctic work [BASSETT-SMITH (1921)] ; or if evaporated-down and kept anaerobically (ZILVA). Orange juice desiccated at room temperature was effective for two years [HARDEN and ROBISON (1920)].

The most efficient antiscorbutic foods, with their relative values. are cabbage 110, lemon and orange juice 100, swede juice 60, germinating peas, beans, lentils, 30, carrot, radish, beetroot juice each 7·5, juice of beef 7·5, cow's milk 1·0–1·5—all of these in the fresh state. Some roots, like radish and beet, are almost useless as antiscorbutics. Cabbage juice boiled for ten minutes at 100° C. and boiled potato soups are good ; raw juice of apples, carrots, and grapes less so ; 5 cc. of raw lemon juice is sufficient to prevent scurvy in sucklings. For older children and adults vegetables should not be cooked for more than 30 minutes, and the raw liquor should be used. Raw tomato is very valuable [CHICK & DALYELL (1919)]. 10 cc. of the fresh juice of strawberries was curative to guineapigs [SMITH *et al.* (1921)]. Bananas are greatly inferior to most other fruits and vegetables ; a large quantity (10 to 15 grams) is required to supply sufficient vitamins for a guineapig [LEWIS (1919)].

A very considerable amount of experimental work has been carried out to determine the retention of their antiscorbutic property by dried fruits and vegetables : except in the case of tomatoes, canning destroys the greater part of it (Lister Institute Research). Orange juice dried at 50–60° C. for half to one hour is undoubtedly reduced in value by half, but the Merrell-Soule method is less destructive, and it is believed by GIVENS & McCLUGGAGE (1919) that this dried juice will serve as a convenient antiscorbutic in infant feeding, polar exploration, etc. MOURIQUAND & MICHEL (1920) believe that the effective properties reside in the fluid of the fresh vegetable cells, which they call " eau vivante " ; but if the cells are dried and water is reabsorbed the efficiency is not regained ; this living vegetable fluid is essential for calcium metabolism ; for the active principles these authors use the term " minimum substances." At Quetta SHORTEN (1921) found that sun dried tomatoes, cabbage and potatoes still retain their antiscorbutic value ; other vegetables were of little or no use.

With regard to dried milks much has been written ; it may be summed up thus : It is recognized that milk-powders may vary in their antiscorbutic properties, according to the initial quantity of the vitamin in the milk (which is influenced by the feeding of the cows) and to the method employed in the drying, the spray process being more destructive to the vitamin than the Just process. This does not invalidate milk-powders as food for infants, but it necessitates their being supplemented by substances containing the requisite vitamin.

the only possible exception being powders prepared by the Just process from summer milk or from cows especially fed [HART, STEENBOCK, & ELLIS (1921)].

For laboratory experiments guineapigs were practically always used, except in a small number made by HARDEN & ZILVA (1920), and also by BARNES & HUME (1921), when monkeys were employed.

Pathological changes found in experimental scurvy.—The blood picture is that of a secondary anaemia with often a leucocytosis due to subsequent bacterial infections; the blood platelets, according to HESS, are not increased. FINDLAY (1921) describes the following changes in the vascular system of guineapigs: (1) degenerative changes in the lining endothelium; (2) extreme congestion; (3) fine oedema of the tissues round the vessels; (4) haemorrhagic areas in close relation to the capillaries, haemorrhages being found as early as the 12th day in the muscles at the back of the knees, and most of the internal organs showing haemorrhagic foci later. There was no fatty degeneration of the heart. The following changes have been noted by MCCARRISON (1919 *a* & *b*), BASSETT-SMITH (1920), LA MER, and CAMPBELL (1920) in the adrenal glands :—increase in size and weight, marked diminution of the adrenal content, haemorrhagic infiltration usually circumscribed in extent and in the cortex, degenerative changes in the cellular elements of the cortex and medulla. From this it is concluded that a scorbutic diet causes a profound depreciation of the functions of the glands in guineapigs and that this occurs before the clinical evidences of scurvy manifest themselves. BESSESEN (1923) states that the spinal cord, lungs, kidneys, testicles and hypophyses are also increased in weight, and that the results found in scurvy and starvation are to a certain extent explicable as due to inanition, though there are marked differences in some organs indicating that the scorbutic condition includes factors differing from those found in ordinary inanition.

MOURIQUAND and his co-workers (1921, 1922 *a* and *b*) show how a hypovitaminosis accounts for cases of transient or relapsing scurvy, which are quite different from avitaminosis as found in the inanition of starvation. These views are also held by GODLEWSKI (1921), who says: "Traces of the living substance in the food of infants serve to keep it alive but in an anaemic and pre-scurvy state. For a normal growing condition it is necessary that not only traces but a daily ration of the essential substances must be given, which are probably required for nuclear formation, and for this thyroid extract, fresh vegetables, milk, fruits and meat are useful."

As stated early in this review, the gradation of one deficiency disease into another is so fine that for the proper understanding and treatment of them it is necessary not merely to focus attention upon one kind of vitamin only, but to see that in the dietary provided all shall be adequately represented.

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MEDICAL ZOOLOGY.

Barrow (John V.). **A Clinical Study of the Intestinal Protozoa, based on Seven Hundred and Twenty-Five Cases.**—*Amer. Jl. Trop. Med.* 1924. Jan. Vol. 4. No. 1. pp. 23–32. [4 refs.]

The aim of this interesting paper is to stimulate the imagination of protozoologists and pathologists; the aim has been present to the author since 1919.

The discovery of yeast-like bodies in the blood of human beings illustrates how easily organisms much bigger than bacteria can get into the circulation from their normal station in the intestine, and the discovery of *Entamoeba histolytica* in a necrotic hip bone in a case of arthritis deformans illustrates a novel conception of intestinal protozoa in pathology; yet neither of these discoveries seems to have sufficiently aroused the attention of protozoologists, much less of pathologists or clinicians. Even if protozoa get from the intestine into the blood and there and then die they may impart toxins and perhaps import bacteria into the circulation.

The author summarizes the results of faecal examination of 725 clinical cases in which some sort of gastric disturbance, or abdominal distress, or failure of appetite, or loss of interest in life was the chief cause of complaint; in 535 *Chilomastix mesnili* was present; in 115 *Entamoeba histolytica*; in 97 trichomonads; in 74 Giardia; in 32 " Craigia "; in 3 Waskia; besides Blastocysts in 261, Spirilla in 180, and fatty acid crystals in 279. He also gives a summary of the cases of arthritis [number not stated] that he has studied. Protozoa was found in the faeces in every case, chiefly Chilomastix (94 per cent.), but also the dysentery amoeba (in 12·5 per cent.), trichomonads (8·3 per cent.), Waskia (6 per cent.), "Craigia" (6 per cent.), Giardia (2·8 per cent.).

When with such prevalence of intestinal protozoa we consider how any dietary indiscretion, or any mechanical defect in the digestive tract, may encourage their growth and enterprise the significance of the two discoveries mentioned at the outset becomes sufficiently arresting.

A. Alcock.

Hegner (R. W.). **Some Investigations on Entozoic Protozoa.**—Reprinted from *Amer. Naturalist.* 1924. Jan.–Feb. Vol. 58. pp. 5–23.

A most interesting and suggestive lecture (well worth perusal where-ever tropical medicine is seriously studied), based on well-established facts, not a few of which have been recently minted in the Johns Hopkins University. For this assemblage of facts the author prefers the term " Medical Zoology " to the term " Parasitology," since many of the animal organisms concerned are not parasites in anything but, perhaps, the universal sense that makes the whole world kin in respect of interdependence. The author also comments on the conventional association of this body of facts with books on tropical diseases, and he agrees with the view that this is essentially a matter of convention, and is not a reflection of any such restrictions in Nature.

A. A.

DE GEDROYC (Michal). **Les protozoaires agents immunisants contre les maladies contagieuses.**—*C.R. Soc. Biol.* 1924. Apr. 4. Vol. 90. No. 12. pp. 907–908.

Arguing that since free-living Protozoa are natural destroyers of bacteria they can be utilized in the field of immunization, the author carried out a series of experiments, briefly summarized in this paper, upon the action of common species of Paramoecium on the virus of rabies, and he gives here the following results of his observations. If a culture of Paramoecium and an emulsion of fixed virus (1 per cent.) are injected under the dura meter of a rabbit rabies subsequently develops; but if the Paramoecia be cultivated with the fixed virus for 24 hours " the microbes of rabies become innocuous " and the culture when injected confers immunity against a subsequent injection of fixed or street virus. Furthermore, a 2 to 4 hours culture of Paramoecium and fixed or street virus injected along with " fresh " Paramoecium possesses protective power against an immediately following injection of virus.

A. A.

KOFOID (Charles Atwood) & SWEZY (Olive). i. **On the Morphology and Behavior of** *Pentatrichomonas ardin delteili* **(Derrieu and Raynaud).**—*Univ. California Public. Zool.* 1923. Aug. 16. Vol. 20. No. 16. pp. 373–390. With 1 plate & 1 fig. [23 refs.]

—— & ——. ii. **Pentatrichomoniasis in Man.**—*Amer. Jl. Trop. Med.* 1294. Jan. Vol. 4. No. 1. pp. 33–41. With 1 fig. [7 refs.]

i. This trichomonad is maintained to be different from *Trichomonas hominis*, having constantly five anterior flagella one of which arises along with the axial filament of the undulating membrane from a blepharoplast distinct from that appertaining to the other four. It eats red blood corpuscles in stools and cultures. It has been observed by the authors in three cases of chronic diarrhoea resistant to treatment, two of them from the tropics and the other from a tropical contact. The morphology, fission, locomotion, culture etc., are described in detail.

ii. *Pentatrichomonas ardin delteili*, distinguished from *Trichomonas hominis* by the possession of five flagella, " should be regarded as the aetiological factor in one type of chronic diarrhoea " in man. Its appearance, behaviour in various circumstances, and method of cultivation are here related.

A. A.

PONOSCHINA (V. G.). [**On the Rôle of** *Trichomonas vaginalis* **in Human Pathology.**]—*Russian Jl. Trop. Med.* Moscow. 1923. No. 1. pp. 27–30. With 1 plate. [In Russian.]

The author examined the vaginal discharge of 22 girls from 2 to 14 years of age, and 55 adult women. In the girls the vagina was normal and *Trichomonas vaginalis* absent, whilst amongst the women 29 were suffering from leucorrhoea, sixteen of them showing large numbers of *T. vaginalis*. The author concludes that the parasite is the pathogenic agent of leucorrhoea. Treatment with douches of permanganate of potash and sodium bicarbonate caused the parasites to disappear only temporarily. It was observed that the number of parasites increased considerably after menstruation and after coitus.

C. A. Hoare.

SWEZY (Olive). **The Pseudopodial Method of Feeding by Trichonymphid Flagellates Parasitic in Wood-eating Termites.**—*Univ. California Public. Zool.* 1923. Aug. 16. Vol. 20. No. 17. pp. 391–400. With 14 figs in text. [6 refs.]

The author has observed Trichonympha and Leidyopsis feeding. The food consisted of pieces of dry wood and also of smaller flagellates such as Trichomitus, and it is engulfed, not by the flagella, nor in the flagellar area, but by peculiarly adhesive pseudopodia formed at the posterior end of the body. In observing these termite flagellates alive normal salt solution is inhibitive and destructive; the liquid of the host's intestine is sufficient.

A. A.

PONSELLE (A.). **Culture des trypanosomes pathogènes.**—*C.R. Acad. Sci.* 1924. Mar. 31. Vol. 178. No. 14. pp. 1219–1221. [5 refs.]

In the culture of pathogenic trypanosomes the principal obstruction, in the author's opinion, is the presence of antibodies in the infested blood; these are adsorbed by a peptone-gelatine medium. Osmotic pressure also plays an important part, therefore the culture-medium should be hypertonic in respect of the blood of the infested host. The medium preferred by the author is constituted as follows:—Pure crystallized NaCl from 0·3 to 0·8 per cent. (determined in each case by the optimum osmotic pressure for the given species of trypanosome); peptone de Witte 2 gm.; purest gelatine (Coignet, gold medal) 2 gm.; normal Na_2CO_3 solution 1 cc.; twice distilled water 100 cc. The gelatine and peptone are quickly dissolved at 100°C. in a water-bath, the solution is autoclaved without filtration for half an hour at 110°C., and after cooling at laboratory temperature (at which it is liquid) is mixed with its own volume of rabbit serum for isolation cultures and of defibrinated rabbit blood for subcultures. The mixture is distributed (3 cc. in each tube) and inactivated for half an hour at 56°C. Culture should begin with 1 or 2 drops of heart blood of a mouse killed at about the middle term of an infection. The tubes after shaking are left to incubate peacefully at 23° 26°C. for 15 days; then, or perhaps a little before, numerous white punctiform colonies can be seen with a hand-lens in the wall of the tube, above the red corpuscles.

The cultivated trypanosomes morphologically are exactly like those figured from the gut of tsetse-flies, but are non-virulent for receptive animals. The differences of osmotic pressure to be allowed for in cultivation may perhaps explain the variable susceptibility of tsetse-flies to infection.

A. A.

REICH (W. W.). *Trypanosoma brucei* **as a Filterable Virus. Studies on the Site of Origin of the Filter-Passing Bodies.**—*Jl. Parasit.* 1924. June. Vol. 10. No. 4. pp. 171–181. [4 refs.]

This is a continuation of work first broached in the *Journal of Parasitology* in 1923 (see this *Bulletin*, Vol. 20, p. 335). In the present paper the author describes his methods, and tabulates the results of experiments, which "indicate that *Trypanosoma brucei* undergoes certain changes in morphology in the internal organs of such nature as to permit passage through the pores of bacteria-proof filters. It would seem that such forms reside in greatest numbers in the liver and spleen of . . . . guineapigs dead of infection. . . . . In a series of seventy-two filtration experiments, using the organs of guineapigs dead of infection with *Trypanosoma brucei*, inoculation of bacteria-free filtrates into normal guineapigs has determined infection in twenty cases. . . . . In a series of seven experiments the filtrates from highly infected blood obtained during the life of the animal did not prove infective for guineapigs."

A. A.

v. Fenyvessy (B.) & Reiner (L.). **Untersuchungen ueber den respiratorischen Stoffwechsel der Trypanosomen.**—*Ztschr. f. Hyg. u. Infektionskr.* 1924. Apr. 7. Vol. 102. No. 1/2. pp. 109–119. [10 refs.]

The essential conclusion of this paper is that Trypanosomes like other animals consume O and give off CO_2, and that they can take their O as readily from simple plasma, or even from serum or bouillon, as from blood.

A. A.

Cerqueira (Dionisio). "*Trypanosoma minasensis.*"—*Sciencia Medica.* 1924. Mar. 31. Vol. 2. No. 3. p. 155.

In December 1923 the author, on examining the blood of a small monkey, *Callitrix pencillata*, found a very motile trypanosome which seemed to be morphologically identical with *T. minasense*, and this diagnosis was confirmed by Chagas, who first discovered it in 1909. Six guineapigs were inoculated with the blood (0·5–2 cc.), containing trypanosomes, but infection was not produced.

H. Harold Scott.

Archibald (R. G.) & Susu (B.). **A Sporozoon from the Spleen of a Case of Splenomegaly in the Sudan.**—*Trans. Roy. Soc. Trop. Med. & Hyg.* 1924. Feb. 21. Vol. 17. No. 8. pp. 482–484. With 2 plates (1 coloured).

The patient that furnished the specimens of the sporozoon here described and beautifully figured was an anaemic cachetic middle-aged Arab with an enlarged liver, a much enlarged spleen, and a history of irregular fever and increasing debility. Kala azar being suspected, the spleen was punctured, and in smears of the spleen-matter there were found (extra-cellular) groups and clumps of crescentic non-pigmentiferous bodies, 9–10 by 3–3·5 microns in their dimensions, having one end more pointed than the other and a loosely-granulous excentric nucleus. No other organisms were found in the spleen smears and nothing was found in the blood; but a blood-film gave evidence of blood destruction, with normoblasts, megaloblasts, and polychromatophilia, and the several percentages of leucocytes in a differential count of 500 were, polynuclears 31, large nononuclears and transitional 17·8, large lymphocytes 19·8, eosinophiles 7·2, and basophiles 0·8. The enigmatic bodies were not found in bloody material from a second spleen-puncture made a fortnight afterwards, nor in peripheral blood examined at the same time, and the observations were inconclusively terminated by the unceremonious departure of the patient.

The nature of the bodies is discussed on the reasonable assumption—justified by the admirable precautions taken throughout against contamination—that they actually came from the spleen. The large nucleus and the lack of a cell wall are held to disprove a vegetable nature. They are thought not to be spores of sarcosporidia, from their site and from the absence of the clear hyaline end. Something may be said both for and against an alternative verdict in favour of haemogregarine or coccidium, in schizogony. It seems safe at least to refer them to the Sporozoa.

A. A.

BENDER (Lauretta) **Kurloff Bodies in the Blood of Guinea Pigs.**—*Jl. Med. Res.* 1924. June. Vol. 44. No. 4. (No. 193.) pp. 383–399. With 2 plates and 2 charts. [21 refs.]

When studying the blood of normal guineapigs a progressive eosinophilia was observed to be coincident with the appearance of Kurloff bodies,' a novel phenomenon that led the author to an investigation of the work already done to determine the nature and origin of these inclusions. Ross's theory that they are stages in the life of a spirochaete was not confirmed. Ross's evidence was for the most part based on vital staining with Unna's polychrome methylene blue; this stain in the author's use was found often to contain a number of short spirochaete bodies having 2 or 3 twists; no spirochaetes could be found by her in guineapig blood or tissues by dark-field illumination. WOODCOCK's theory that the Kurloft bodies are phagocyted and imperfectly digested red-blood corpuscles was not confirmed—nor could his evidence of the presence of iron in these inclusions be verified; in fact, to all the stains used by the author—and particularly to the new methylene blue G G stain—the reactions of the erythrocyte and the Kurloff body were so different as to discountenance the theory that the two are inter-related. Cells containing a Kurloff body sometimes contain also small round "accessory" bodies about the size of a platelet; these, which have not previously been noticed, may sometimes be demonstrated by Durand's vital stain, but by other staining methods they are disclosed only as unstained points. For the rest, the paper is largely an account of the new methylene G G vital stain, which the author regards as particularly valuable for the study of Kurloff bodies.

A. A.

i. MANIFOLD (J. A.). **Report on a Case of Sarcosporidiosis in a Human Heart.**—*Jl. Roy. Army Med. Corps.* 1924. Apr. Vol. 42. No. 4. pp. 275–279. With 4 text figs. [7 refs.]
ii. YAKIMOFF (W. L.). *Bodo porteri* **n. sp.**—*Ann. Soc. Belge de Med. Trop.* Brussels. 1924. Jan. Vol. 3. No. 3. pp. 305–306. With 1 fig.
iii. MAZZA (Salvador). **On the Duration of Relative Immunity in Malaria of Birds.**—*Jl. Trop. Med. & Hyg.* 1924. May 1. Vol. 27. No. 9. pp. 98–99.

i. Five cysts, of microscopic size, in the muscle of a heart in the pathological laboratory of the R.A.M.C.
ii. Cultivated from the intestinal contents of a mouse.
iii. Already noticed (*ante* p. 425).

A. A.

BARBER (M. A.). **The Effect of *Chara robbinsii* on Mosquito Larvae.**—*Public Health Rep.* 1924. Mar. 28. Vol. 39. No. 13. pp. 611–615. [14 refs.]

The author summarizes, with full references, the published observations, some of them made under artificial but most of them under natural conditions, of most of the writers on Chara and its relations to mosquito larvae. Some (CABALLERO and PARDO in Spain) have definitely pronounced the relation in the case of certain species of these to be hurtful; others (METZ, SMITH, RUCKER in America, and GALAMINI in Italy) have almost as definitely concluded it to be not hurtful; others (ALLUAUD in Morocco, BUXTON in Palestine, HACKER in Malaya, VASCONCELOS in Mexico) have been not decidedly against, but not conclusively in favour of a deleterious influence exercised by their local species of Chara. The author here records his own very careful observations in Louisiana of the relations of *Chara robbinsii* to the larvae of the local species of Anopheles, of *Aëdes aegypti* (*Stegomyia fasciata*), and of *Culex quinquefasciatus*; from these observations made both in nature and in the laboratory he makes the commendably cautious generalization that "whatever larvicidal power may be possessed by some species of Chara, this property is not common to the whole genus," and the equally judicious recommendation that "in any test of the possible larvicidal effect of Chara, or of any other plant, the food requirements of the larvae should be taken into consideration."

The author observed larvae of all sizes and pupae of Anopheles to be plentiful in rice-fields and stagnant ditches containing *Chara robbinsii* and extremely so where it formed protective mats just above the surface of the water; in such mats 4 to 5 larvae could be taken at a dip.

In the laboratory, larvae did not grow well and frequently died out in aquaria containing merely green fresh Chara; but in aquaria well supplied with food—even if the food were fine-ground fresh or dry Chara, or rotting Chara—they throve equally well whether fresh growing Chara were present or not. Chara alone, unless partly rotting, is a poor source of food for the larvae; but the mixture of living and rotting Chara is so good that the author is accustomed to use if for rearing mosquito larvae.

A. A.

WILLIAMSON (K. B.). **The Use of Gases and Vapours for killing Mosquitoes breeding in Wells.**—*Trans. Roy. Soc. Trop. Med. & Hyg.* 1924. Feb. 21. Vol. 17. No. 8. pp. 485–519. With 4 figs. [29 refs.]

The greater part of this paper deals with the results of experiments in the laboratory, but a few tests were made in shafts and wells in the open.

Paraformal (3 oz. per sq. yard) vaporized at the bottom of a 3-ft. open shaft killed larvae of *Anopheles maculipennis* in 32 minutes, and SO_2 (2½ lb. S per 1,000 c. ft.) killed them in closed wells in 3 to 4 hours. SO_2 may act in part indirectly by acidifying the water; but the sulphur method is tedious and expensive. Chloropicrine evaporated in an open well 3½ ft. deep killed all larvae of *A. maculipennis* and *Culex pipiens* within 3 days. The vapour of white flake-naphthaline killed larvae of *Ochlerotatus punctor* within 4 hours, and an old sample of crude naphthaline had the same effect over night. Chlorine generated from HCl and bleaching powder is too expensive and too difficult for manipulation in a well for practical use. It is worth noting that a jet of steam thrown upon the surface of the water (in a pie-dish) containing larvae of *A. maculipennis* killed about half of them, although the heat communicated to the water was negligible. Successful laboratory experiments with CS_2 and H_2S are also recorded. In laboratory experiments with chloropicrine eggs of *A. maculipennis* were much more resistant than larvae.

In using gases wells should be closed, and the author gives an illustration of a portable parachute to be lowered into the well in order to cut off a small closed space above the water. He gives also figures of apparatus for generating gas at water level and of a floating evaporator, and a list of cheap volatile poisons known to be toxic to mosquitoes.

A. A.

GUBIN (V. M.). [**On the Oiling of Mosquito-Breeding Waters.**]—*Russian Jl. Trop. Med.* Moscow. 1924. No. 2. pp. 53–57. [7 refs.] [In Russian.]

Oiling is almost the only method employed in Russia for the destruction of mosquito larvae; its chief defect is the comparatively rapid disappearance of the petroleum film, which may be due either to evaporation or oxidation or to assimilation of hydrocarbons by bacteria. The author regards the first two causes as insufficient and therefore directed his attention to the third cause. To a sterilized medium consisting of distilled water 1000·0, magnesium-ammonium phosphate 1·0, potassium phosphate 0·5, and calcium sulphate 0·1, a few drops of hydrocarbons (kerosene, benzene, petroleum) and some slime and water of Moscow ponds were added. The cultures were kept at 35° C. and in nearly all a bacterial film developed and was accompanied by a gradual disappearance of hydrocarbons from the medium. To protect the petroleum film from bacteria the author suggests adding bactericidal substances, such as naphthene acids.

C. A. Hoare.

WEED (A. C.). [**Another Factor in Mosquito Control.**]—*Ecology.* Brooklyn, N.Y. 1924. Jan. Vol. 5. No. 1. pp. 110–111. [Summarized in *Rev. Applied Entom.* 1924. Apr. Vol. 12. Ser. B. Pt. 4. p. 55.]

A thick surface growth of water-hyacinth has been observed by this authority to have the peculiarity of immediately entailing the destruction of mosquito larvae in the affected water. The probable explanation is that the water-hyacinth harbours multitudes of *Entomostraca,* probably a Ceriodaphnia.

HACKER (H. P.). **Malaria Bureau Annual Report, 1922.**—*Federated Malay States Report for the Year 1922.* pp. 16–22.

Observations have been carried on systematically to ascertain whether the local Anopheles have any particular breeding-season or any seasonal prevalence; but no definite conclusions have yet been reached, although certain species do appear to breed throughout the year. Observations of various breeding-places appear to give further support to the view that it is the water itself that tells on the species. Observations of the influence of Characeae give the conflicting results now becoming common: Anopheles larvae were found in ponds where two species of these algae were growing, and lived well in their presence in the laboratory; moreover, the film that formed on the water, to which CABALLERO attributes larvicidal properties, was found to consist mainly of bacteria and infusoria and to be very attractive food for the larvae; subsequently a third species of Characeae was discovered that "certainly seems to act as a deterrent to mosquito breeding." The interesting observation that the larvae of *A. lindesayi* and *A. wellingtonianus* cannot be distinguished one from the other is recorded.

A. A.

KLIGLER (I. J.). **Notes on the Hibernation of Anopheles Mosquitos in Palestine.**—*Bull. Entom. Res.* 1924. May. Vol. 14. Pt. 4. pp. 403–407. [2 refs.]

As a result of systematic searching for eggs and larvae and adults during the winter months, supplemented by observation of eggs and larvae in the laboratory, the author concludes that the common malaria-carrying mosquitoes of Palestine can survive through part or all of the winter in all their stages.

A. A.

FISHER (H. C.). **Report of the Health Department of the Panama Canal for the Calendar year 1922.**—120 pp. With 7 plates. 1923. Panama Canal Press. Mount Hope, C.Z.

Statements worthy of note in this report are (1) that a lake covered with a dense mat of *Chara foliorosa* and other waterweeds was found to be a fertile breeding-ground of *Anopheles albimanus*; and (2) that invasions of *Anopheles albimanus, tarsimaculatus,* and other species may be expected from breeding-places distant two miles or more.

A. A.

TER POORTEN (F. H.). **Some Remarks on** *M. ludlowi* **and on the Fight against this Mosquito.**—*Meded. Burgerlijk. Geneesk. Dienst in Nederl.-Indië.* 1924. Pt. 1. pp. 99–114. With 7 plates. [9 refs.]

A variety of *Anopheles ludlowi* characterized by darker pigmentation of the wing and diminished susceptibility to malarial infection is here described. According to the author, *A. ludlowi* makes the vicinity of man the first consideration in its choice of a breeding-place, irrespective of the nature of the water, whether brackish or fresh, clean or foul; hence control of this species must include treatment of all kinds of water in a littoral tract. *A. ludlowi* can travel distances of 1½ to 2 kilometres in quest of blood.

A. A.

NIKOLSKI (V. V.). **[Observations on the Biology of the Malaria Mosquito,** *Anopheles maculipennis* **Mg.]**—*Russian Jl. Trop. Med.* Moscow. 1924. No. 2. pp. 41–48. [8 refs.] [In Russian.]

A general account is given of the biology of *A. maculipennis* based on observations conducted throughout the year 1923 near Moscow.

The following are the only species of Anopheles recorded from Russia up to the present:—(1) *A. maculipennis* Mg. (2) *A. bifurcatus*. (3) *A. superpictus* Grassi. (4) *A. sinensis* Wiged (*pseudopictus* Grassi). (5) *A. pulcherrimus* Theobald (Cellia)

All five occur only in Turkestan; in the Caucasus *A. pulcherrimus* is absent; in European Russia *A. superpictus* is absent as well; whilst only *A. maculipennis* and *A. bifurcatus* are found near Moscow and Petrograd.

C. A. Hoare.

EDWARDS (F. W.). **A Synopsis of the Adult Mosquitos of the Australasian Region.**—*Bull. Entom. Res.* 1924. May. Vol. 14. Pt. 4. pp. 351–401.

In this synoptic revision of the mosquitoes of the Australasian Region the author has applied the same characters for taxonomic purposes as in his revision of the mosquitoes of the Palaearctic Region (*Bull. Ent. Res.* 1921, Vol., 12, p. 263) and of the Oriental Region (*Ind. Jl. Med. Res.* 1922, Vol. 10, pp. 249 and 430).

A. A.

WRIGHT (W. Rees). **On the Function of the Oesophageal Diverticula in the Adult Female Mosquito.**—*Ann. Trop. Med. & Parasit.* 1924. Apr. 30. Vol. 18. No. 1. pp. 77–82. [5 refs.]

Of 42 mosquitoes (*Anopheles maculipennis* and a few *Theobaldia annulata*) fed, 18 on man, 23 on sugar, and 1 on orange juice, and all killed immediately afterwards, blood was found in the gut of all of the first 18 and traces of it in the oesophageal diverticula of 5 of these; whereas no food was found in the gut of any and much food was found in the diverticula of all of the last 24 (23 + 1).

A. A.

GRASSI (B.). **Sull'** *Anopheles elutus.*—*Rend. R. Accad. Naz. Lincei.* Rome. Classe Sci. fisiche, matemat. e naturali. 1924. Mar. 16. Vol. 33. No. 6. pp. 207–209. With 2 figs.

One of the final characters used by EDWARDS for distinguishing *A. elutus* (from *A. maculipennis*) is the absence of floats from its egg; but of three specimens obtained by the author from Palestine one laid eggs without floats and two laid eggs with floats, and corroborative observations were made in Palestine. The author has also found female Anopheles in Italy that laid eggs without floats He regards the distinction between *A. elutus* and *A maculipennis* as doubtful.

A. A.

BRADLEY (G. H.). **The Natural Breeding Places of Anopheles Mosquitoes in the Vicinity of Mound, Louisiana.**—*Amer. Jl. Trop. Med.* 1924. Mar. Vol. 4. No. 2. pp. 199–223. With 9 figs. [1 ref.]

The natural breeding-grounds of Anopheles in Louisiana are lakes, "bayous" (or sluggish moribund channels of deltas), and "sloughs" (or dead "bayous" that have become stagnant by obstruction). Clearing these waters of weed diminishes breeding but does not stop it altogether, unless the clearing be well done and be maintained.

A. A.

KONOKHOV. **[New Biological Peculiarities of** *Anopheles.*]—*Russian Jl. Trop. Med.* 1924. No. 2. pp. 48–49. [Summarized in *Rev. Applied Entom.* 1924. May. Vol. 12. Ser. B. Pt. 5. p. 77.]

The story told and stated to be confirmed by experiment in this paper, is that Anopheles observed to be hovering over mattresses spread for disinfection in the sun were found to be attacking bedbugs and body-lice, paralysing these insects by a stab near the head and then by a second thrust sucking the contents of the victims' viscera. Anopheles that had glutted in this way were found to contain malaria parasites supposed to have come through the bugs and lice.

A. A.

MACGREGOR (Malcolm E.). **A Note on the Fertilisation of Anopheles.**—*Bull. Entom. Res.* 1924. May. Vol. 14. Pt. 4. p. 413.

[Major HAROLD (see this *Bulletin, ante* p. 142) was able to get *Anopheles maculipennis* to pair readily in cages at Aldershot.] The present author found no difficulty in getting all the four local species of Anopheles to pair in cages in Mauritius.

A. A.

i. HOWARD (L. O.). **On Zoophilism with Anopheles—a Review.**—*Jl. Parasit.* 1924. June. Vol. 10. No. 4. pp. 191–198. [22 refs.]
ii. FREEBORN (Stanley B.). **The Terminal Abdominal Structures of Male Mosquitoes.**—*Amer. Jl. Hyg.* 1924. May. Vol. 4. No. 3. pp. 188–212. With 18 figs. [21 refs.]
iii. SACQUEPÉE (E. E. J.). **Le rôle des insectes piquers en France et dans le Nord-Africain.—La désinsectisation.**—*Arch. Méd. et Pharm. Milit.* 1923. Nov. Vol. 79. No. 5. pp. 647–699.

i. This is a good review of the subject, with a comprehensive list of references.

ii. A clearly expressed and generalized account of the subject.

iii. An excellent introduction to the principles of medical entomology.

A. A.

HERTIG (Marshall) & WOLBACH (S. Burt). **Studies on Rickettsia-like Micro-Organisms in Insects.**—*Jl. Med. Res.* 1924. Mar. Vol. 44. No. 3. (Whole No. 192.) pp. 329–374. With 4 plates. [41 refs.]

This paper includes, besides the authors' own observations on Rickettsia-bodies found in various species of insects and besides their own ideas of the nature and bionomic and pathogenetic significance of these bodies, a most useful tabular summary of the known Rickettsiae and their respective hosts, and a bibliography of the group.

The authors have no hesitation in recognizing the Rickettsiae as micro-organisms, having as distinctive characters a bacterium-like form, minute size, slight affinity for aniline stains, and an occurrence in clumps or dense masses within or upon cells. They can be distinguished from lightly-stained Giemsa artifacts, which are evenly scattered, and from the scattered granules normally occurring in smears of insect tissues, which are uniformly spherical, larger, and fewer.

The relation of the Rickettsia-bodies to their respective arthropod hosts varies in constancy and intimacy, from more or less harmless parasitism (" though the typhus organism is more or less pathogenic to the louse ") to a constant and definite symbiosis. Some, such as the Rickettsia of the bedbug, are invariably present in all the individuals of the specific host and are transmitted from the host to its offspring, and in these respects they resemble the yeast-like and bacterium-like symbiotes of many insects. Others, such as the Rickettsia of *Culex pipiens*, though transmitted from parent to offspring, are not constantly present in all individuals of the specific host ; this only approximates to symbiosis.

The nature of the Rickettsia-bodies has always been in dispute.. They have been regarded variously as normal cell-inclusions, Chlamydozoa, bacteria, mitochondria, and cell-debris. Some of the bodies identified as Rickettsia may be bacteria, and, indeed, there are " several groups of bacterium-like organisms found in insect tissues, some of which may be related to the Rickettsiae," being also symbiotes and transmitted hereditarily. But the authors have very little patience with WOODCOCK's theory that Rickettsia-bodies are the dust and ashes of haematophagy and haematoboly.

Though the authors would prefer that the generic term "Rickettsia" should be restricted to intracellular polymorphic forms of admitted pathogenetic significance [? for man], they are content for the present to classify Rickettsiae, for purposes of further study, in three groups, namely, (1) intracellular forms exhibiting coccoid, rod and filamentous phases, *e.g.*, *Rickettsia prowazeki*, *Dermacentroxenus rickettsi*, and the Rickettsiae of the bedbug and *Culex pipiens*; (2) intracellular, uniform coccoid and diplococcoid forms, *e.g.*, of Culicoides and the book-louse Dorypteryx; and (3) forms in which the dominant phase is extracellular in the lumen of the host's gut, *e.g.*, *Rickettsia pediculi*, *R. melophagi*, and the Rickettsiae of the book-louse (Psocus) and of various Mallophaga.

A. A.

MCINDOO (N. E.) & SIEVERS (A. F.). **Plants tested for or reported to possess Insecticidal Properties.** *U.S. Dept. Agric. Dept. Bull.* No. 1201. Washington. 1924. Mar. 19. 61 pp. [95 refs.]

This catalogue includes 260 species of plants possessing, or supposed to possess, insecticidal properties of some sort or degree. It is obviously impossible to make an abstract of a catalogue: it must be sufficient to state the author's conclusion that only about 5 per cent. of them furnish material for efficient insecticides, and of these only half are to be regarded as "satisfactorily efficient," namely, the three species of Chrysanthemum (*cinerariaefolium*, *coccineum*, and *marschalli*) used for making pyrethrum insect powder, two species of Derris (*elliptica* and *uliginosa*), and a Peruvian root known locally as *cubé* and *barbasco*. The author's opinion of the others is that most of them are not worth consideration, though some of them, when properly prepared and used, are efficient against certain species of insects. The catalogue is full of curious and suggestive information and is well worth having.

A. A.

i. SULLIVAN (K. C.). **The Use of Calcium Cyanide for the Control of Fleas and other Insects.**—*Jl. Econom. Entom.* 1924. Apr. Vol. 17. No. 2. pp. 230–238.

ii. WADE (Otis). **The Effectiveness of Calcium Cyanide in the Extermination of the Black Tail Prairie Dog,** *Cynomys ludovicianus* **(Ord.).**—*Ibid.* pp. 339–342.

i. Calcium cyanide, which gives off hydrocyanic acid gas on contact with moisture in air or soil, is obtainable in flakes and in granules and powder, which are simply scattered about the field of action.

For fleas, "calcium cyanide used at the rate of eight ounces to 100 sq. ft. can be depended upon to give practically a 100 per cent. kill. In a building which can be closed, four ounces to 100 sq. ft. will give the same results."

ii. Calcium cyanide has also been used with great success to extirpate the large ground squirrels known as prairie dogs, 1 to 2 ounces of flakes being simply thrown into each burrow to a distance of 1 or 2 feet from its mouth without further toil. The best results were obtained in damp weather.

A. A.

KING (H. H.). **[The Use of Sand-Fly Repellants.]** [Correspondence.]—*Trans. Roy. Soc. Trop. Med. & Hyg.* 1924. Feb. 21. Vol. 17. No. 8. p. 530.

The repellant, recommended by LISTON and endorsed by the author, is a solution of 2 drachms of menthol in an ounce of spirits of turpentine; it is applied rather to the clothing than to the skin and it remains potent for 2 or 3 hours.

A. A.

GLASER (R. W.). **The Relation of Microörganisms to the Development and Longevity of Flies.**—*Amer. Jl. Trop. Med.* 1924. Jan. Vol. 4. No. 1. pp. 85-107. With 3 figs. [19 refs.]

After briefly reviewing a part of the history of the vast question of the influence—whether ancillary or prejudicial—of the ordinary intestinal bacteria upon the life-processes of their host, the author describes fully his own experimental observations of the matter. In his experiments he used larvae of Drosophila and adults of it and Musca and Stomoxys and Lyperosia. The summary of his conclusions is as follows :—

" 1. The growing or larval stages of flies are dependent upon certain accessory growth factors which must be ingested with the food.

" 2. These accessory growth factors are obtained by the larvae from bacteria or yeasts, as well as from higher plant and animal tissues.

" 3. When rearing flies on media sterilized at high temperatures, the necessary growth factors for the larvae are destroyed, but can be replaced by contaminating the media with living bacteria or yeasts, by adding large quantities of dead bacteria or yeasts killed at low heat, or by adding fresh sterile animal tissue extracts or fresh sterile plant juices.

" 4. Non-pathogenic bacteria, when ingested by adult flies, shorten their life span and reduce the number of ovipositions.

" 5. Microörganisms and their activities are not absolutely essential to the normal growth, development, and longevity of the flies investigated.

" 6. Microörganisms are present in wild flies, especially in the larvae, because owing to their habits the ingestion of bacteria, yeasts, fungi, etc., cannot be avoided.

" 7. Microörganisms may be one of the principal sources for the accessory growth factors of some larval flies found breeding in certain types of media in a state of nature, but this assumption must not be regarded as a proved fact."

A. A.

YORKE (Warrington) & MACFIE (J. W. S.)). **The Action of the Salivary Secretion of Mosquitoes and of** *Glossina tachinoides* **on Human Blood.**—*Ann. Trop. Med. & Parasit.* 1924. Apr. 30. Vol. 18. No. 1. pp. 103-108. [1 ref.]

"1. An emulsion of the salivary glands of *A. maculipennis* powerfully agglutinates the erythrocytes of human blood and, less strongly, those of the donkey, rabbit and dog; it has no agglutinating action on the red corpuscles of the mouse, guinea-pig or *Cercopithecus* sp.. Emulsions of the stomach and of the ventral oesophageal diverticulum exerted no agglutinating action.

" 2. The haemagglutinin is thermolabile, being destroyed by heating to 60°C. for two minutes or to 50°C. for thirty minutes, and the agglutinated red cell masses dissociate completely under these conditions.

" 3. Similar salivary gland emulsions of *Culex pipiens, Theobaldia annulata, Stegomyia fasciata* and *Glossina tachinoides* do not agglutinate human red cells, nor does the salivary gland emulsion of *Stegomyia fasciata* agglutinate the red cells of any of the animals mentioned above.

"4. No haemolysin was detected in the salivary gland emulsion of any of these insects.

5. The salivary gland emulsion of *Stegomyia fasciata* exerted no anticoagulating action on human blood, whilst in the case of *A. maculipennis* and of *Glossina tachinoides*, the anticoagulating action was quite definite.

"6. The blood in the stomach of *A. maculipennis* two hours after feeding on a human being was found to exhibit complete agglutination of the erythrocytes, but to be unclotted, whilst that in the stomach of *S. fasciata*, a similar period after feeding on man, exhibited no agglutination, but was coagulated.

"7. This indicates that the salivary secretion is in part withdrawn into the stomach with the blood when the mosquito feeds; further evidence in support of this is the fact that sporozoites were found intermingled with the blood in the stomach and ventral oesophageal diverticulum of infected *A. maculipennis* examined shortly after feeding."

A. A.

Blacklock (D. B.) **Preliminary Report on the Prevalence of the Tsetse-Fly.**—*Sierra Leone Annual Med. & Sanitary Report for the Year* 1922. (Appendix 8.) pp. 68–74.

The observations here recorded were made at the height of the rainy season (July-August) on the Cape Lighthouse Peninsula, the highest temperature recorded during the 39 days' term of observation being 82° F. and the lowest 69° F. *Glossina palpalis* was fairly numerous and was active. Although it was found in considerable numbers in mangrove swamps it did not breed there. It breeds on ground shaded by undergrowth or beneath the shade of oil-palms that have not been stripped of their lower petioles; and such ground may be quite independent of fresh water and at least a quarter of a mile distant from sea. Of 471 wild flies dissected over 5 per cent. were infected with trypanosomes; the infection was located in the proboscis in every instance but one, and in this one instance it was situated in the salivary glands.

A. A.

Curson (H. H.). **Notes on** *Glossina pallidipes* **in Zululand.**—*Bull. Entom. Res.* 1924. May. Vol. 14. Pt. 4. pp. 445–453. With 4 plates. [1 ref.]

These interesting observations of *Glossina pallidipes* relate to Zululand, where the fly exists chiefly in "bush veld," which, though it spreads over hundreds of square miles, is not found above about 1,500 feet. In summer, when the waters are out, the fly ranges far and wide in this veld; but in winter, when the waters are confined and the bush (being deciduous) is bare, it shelters in jungly thickets along streams; thus it can hardly be said to be restricted to definite "fly-belts." It dislikes wind and rain, does not avoid human dwellings, and seldom or never follows animals into open country far from bush. Its favourite feeding time is late afternoon—even in winter when daylight fails—though it also may be considerably active in the early morning and forenoon. Whatever may be the case elsewhere and with other species, the progress of European order does not in Zululand tend to displace *G. pallidipes*. Before European order game disappears, but much cattle is introduced; large tracts of open veld are ploughed, but the jungly riparian stretches (which under native conditions are cleared for cultivation) are left untouched ; veld fires are controlled and the grazing cattle avoid the seedlings of Acacia and Calastrus bush [which, we assume, the wild herds would have browsed down] ; fences also are put up, which protect trees. Thus the ultimate result of European settlement in the case of Zululand is to comfort *G. pallidipes* in the essential item of shade.

A. A.

FULLER (Claude). **Tsetse in the Transvaal and Surrounding Territories ; an Historical Review.**—*Union of S. Africa. Department of Agriculture. Entomology Memoirs.* Memoir No. 1. 1923. 68 pp. With 10 maps & 14 figs.

This interesting and perspicacious report should be read in its entirety. Examining the records relating to the occurrence of tsetsefly in territory now for the most part included in the Transvaal, and beginning with the account (which he regards as probably the first to have been published on the subject) given, in 1836, by a certain David HUME, of the damage done by tsetse during a journey along the Limpopo, the author traces the disappearance of the fly throughout an extensive tract of country south of that river and west of the Drakensberg in times anterior to the great outbreak of rinderpest. Even in 1871 " Theunis de Klerk told Baines that ' he thought that the fly was a curse that was being removed from the country,' " and in 1878 FYNNEY wrote that " many parts which six years ago were known as fly country are now entirely free." The two outstanding features of the historical retrospect emphasized by the author are (1) that while the fly continued abundant in the low-lying country east of the Drakensberg down to the outbreak of rinderpest in 1896, it had disappeared before that time, without the intervention of any cataclysm, in the northern and western Transvaal ; and (2) the existence of evidence, when the fly still flourished in the western Transvaal, of its association with a particular kind of cover known as " bosrande."

The conclusions and inferences of his historical retrospect are summarized by the author as follows :—

" (I). A practical interest cannot fail to attach to a full examination of the causes which led to a gradual disappearance of tsetse from the Transvaal and the surrounding territory, because :—

(*a*) the disappearance of the insect accompanied the extinction or driving away of certain large wild animals ;

(*b*) the disappearance took place throughout many large areas in the absence of any general settlement by Europeans ;

(*c*) in the greater part of the infested territory the disappearance did not coincide with any abnormal climatic condition ;

(*d*) the disappearance also took place in the presence of many possible sources of food supply, as presented by a variety of wild animals, including antelopes, wildbeeste, zebra, and, in settled areas, by domestic stock.

" (II). Tsetse existed in the north-west Transvaal by virtue of peculiar and localized floral-faunal associations. Thus the fly seems to have been strikingly dependent upon peculiar and circumscribed plant assemblies for a favourable habitat, and to have found an appropriate food supply in the blood of certain wild animals regularly frequenting its haunts.

" (III). As these plant-assemblies or woodings remain and have always harboured, to a greater or lesser extent, a variety of wild animals, it seems as if some inter-relationship existed between the tsetse and its animal hosts. On the floral-faunal combination the permanency of the insect depended, and this permanency was either governed by the regularity of habit on the part of the hosts or the suitableness of their blood to the successful and continuous propagation of the insect.

" (IV). The disappearance of tsetse from the eastern low country of the Transvaal and the adjoining Portuguese territory (Gazaland, Inhambane, and Lourenco Marques) followed suddenly upon rinderpest in the absence of any regular or recognised system of game preservation.

" (V). It may be assumed that the extinction of fly in both the Transvaal and in the part of Portuguese East Africa under reference was due to the sudden and universal application of a process, leading to extinction, which had been working gradually over many years in the west and north of the Transvaal.

" (VI). It is extremely probable that *Glossina pallidipes* occupied parts of the Districts of Gazaland, Inhambane, and Lourenco Marques.

" (VII). As *Glossina pallidipes* and *Glossina morsitans* both survived rinderpest north of the Zambesi, and as *Glossina pallidipes* survived south of the Maputa, it may be reasonably assumed :—

(*a*) that *Glossina pallidipes* formerly inhabited parts of the intervening 700 miles of territory, and was not always so isolated as it is to-day in Zululand ;

(*b*) that *Glossina pallidipes* was eliminated from the intervening territory by the same process that led to the ultimate disappearance of *Glossina morsitans* from adjacent Transvaal areas.

" (VIII). The process leading to the disappearance of *Glossina morsitans* from the eastern Transvaal at the time of the rinderpest tended to eradicate *Glossina pallidipes* in Zululand, but failed probably because the plant assemblies of Zululand, affording this tsetse a favourable environment, were relatively vast, and successfully harboured a greater food supply. This is explained by these plant assemblies being game sanctuaries in a gunless land, wherein a sustained effort at game preservation had been maintained by the Imperial Government during the period 1887 to 1897.

" (IX). It may be assumed for *Glossina morsitans* that this species, at least, is not able to accommodate itself to changes of environment following the settlement of fly-country by a population possessing fire-arms and given to hunting regularly.

" (X). The complete eradication of the wild fauna does not appear to be essential to tsetse suppression, but a decided reduction thereof—followed up by a constant disturbance of the animals which escape, and to such an extent as to bring about changes of habit and shyness—tends to lead to the disappearance of the insect."

A. A.

GIBSON (A.). **[Report of the Dominion Entomologist for the Two Years 1919 and 1920.]**—*Canada Dept. Agr. Dominion Ent. Rpt.* 1919–1920. 40 pp. With 5 figs. [Summarized in *Experim. Station Rec.* 1924. Apr. Vol. 50. No. 5. p. 454.]

The summary gives the results of a number of academic observations on the effect of experimental diets on the longevity and reproduction of the housefly, stable-fly (Stomoxys), and horn-fly (Lyperosia). A bibliography of 26 titles is included.

A. A.

STYLE (F. W.). **The Larva of the Warble-Fly as a Human Parasite.**—*Brit. Med. Jl.* 1924. June 21. pp. 1086–1087. [5 refs.]

This is a good illustrative case. The patient was a farmer's child in Devon. In November and December the little patient lost flesh and appetite, and during the following January he had recurrent urticaria of the neck. At intervals during February painless swellings arose in different parts of the face and subsided in the course of a few days or hours, and sudden head pains and headaches occurred sometimes along with vomiting—but there was no fever. Early in March there occurred a varicella-like rash on the abdomen. About the middle of March, along with transitory swellings of the face, three definitely circumscribed swellings appeared in different parts of the scalp and from each of these within the next fortnight a maggot emerged. These were identified by AUSTEN as penultimate-stage larvae of *Hypoderma lineatum.*

A. A.

LEGER (André) & COUPUT (André). **Nasomyiase à** *Chrysomyia dux,* **Esch.**—*Bull. Soc. Path. Exot.* 1924. May 14. Vol. 17. No. 5. pp. 375–376.

The patient, a youth of 16, came to hospital at Hué, Annam, for repeated attacks of epistaxis along with nasal obstruction and very severe pain in the nose. In the intervals of epistaxis there was discharge of a malodorous serosanguinolent fluid. On examination the after part of the palate was found to be gangrenous and perforated, permitting the extraction of 5 or 6 maggots. Under treatment with chloroform, carbolic, and terebinthine lotions, and menthol vapour 70 maggots came away in the course of 5 days, and although the palate and after part of the nasal fossae were considerably damaged and part of the nasal septum was destroyed all the lesions healed very quickly after their removal. The determination of the maggots as *Chrysomia dux* was made by ROUBAUD.

A. A.

JOURNAL OF THE DEPARTMENT OF AGRICULTURE. Pretoria. 1924. Apr. Vol. 8. No. 4. p. 416.—**Destruction of Blow-Fly Maggots: an Experiment.**

An observation from South Africa of a carcase heavily infested with blowfly maggots from which wonderfully few flies issued; about 60 per cent. of the pupae had been destroyed by a Chalcid parasite.

A. A.

KEILIN (D.). **On the Life History of** *Neottiophilum praeustum* **(Meigen 1826) (Diptera-acalypterae) parasitic on Birds, with Some General Considerations on the Problem of Myiasis in Plants, Animals and Man.**—*Parasitology.* 1924. Jan. Vol. 16. No. 1. pp. 113–126. With 1 plate & 3 text figs. [29 refs.]

In this paper are described, for the first time, the structure of the egg, larva, and pupa of *Neottiophilum praeustum,* an Acalypterate fly, the larvae of which inhabits the nests of various birds and feeds intermittently upon their blood.

From his observations of the anatomy of the larva of this and many other cyclorraphous species the author propounds the general statement that those larvae that live on decomposed organic matter have the pharynx provided with longitudinal ridges, while those that feed upon living tissues, of animals and plants, do not possess these ridges.

A. A.

BATHELLIER (Jean). **Premiers résultats zoologiques de l'étude des rats et des puces à Phnom-Penh.**—*Bull. Soc. Path. Exot.* 1924. May. 14. Vol. 17. No. 5. pp. 372-375. [2 refs.]

The plague mammals of Phnom-Penh (Cambodia) are *Mus decumanus* and *rattus* and the musk-" rat " (*Crocidura sp.*) ; of 400 specimens collected 55·5 per cent. were *decumanus*, 40 per cent. *rattus*, and 4·5 Crocidnra ; *decumanus* is the rat of the crowded parts of the town, *rattus* is suburban. Fleas were comparatively few ; only 49 were collected, of which four-fifths were *Xenopsylla cheopis* and one-fifth *X. astia*.

A. A.

KENYA. Colony and Protectorate of ; **Annual Report of the Bacteriological Laboratory for the Year 1922. Vol. XIII.** [KAUNTZE, (W. H.). Senior Bacteriologist.]—Section 9. Rat Fleas. pp. 190-192. With 1 chart.

Rat fleas systematically collected in Nairobi were fewest in April and November (wet months) and most numerous in January and June (dry months). Of 3,105 fleas from 1,146 rats, 1,862 were *Xenopsylla cheopis* and 974 *X. brasiliensis*.

A. A.

PETTIT (R. H.). [**Report on the Section of Entomology.**]—*61st Ann. Rept. Michigan State Bd. Agric. 1921–22.* East Lancing, Mich., 1923. pp. 211-214. [Summarized in *Rev. Applied Entom.* 1924. July. Vol. 12. Ser. B. Pt. 7. p. 105.]

Records finding of *Xenopsylla brasiliensis* on rats in Michigan.

A. A.

DUNN (Lawrence H.). **Life History of the Tropical Bedbug,** ***Cimex rotundatus*****, in Panama.**—*Amer. Jl. Trop. Med.* 1924. Jan. Vol. 4. No. 1. pp. 77–83.

These observations of the life-history of *Cimex rotundatus* were made in Panama in January, on the issue of 25 fresh-laid eggs.

Eggs hatched after 5 or 6 days, and many larvae fed within 6 hours of emergence. Larvae moulted to 1st nymph stage within 4 or 5 days ; the three successive moults into the 2nd to 4th nymph stages occurred severally within the 3rd to 5th days of each stage, and the 5th (final) moult into the adult stage on the 5th to 8th day after the 4th nymph stage. Pairing might take place within 24 hours of assuming the adult stage and egg-laying on the 3rd day after. The longevity of active reproductive females ranged from 23 to 167 days, and the term of actual egg-production from 40 to 94 days. The maximum number of eggs laid by a single female was 439, and the minimum 82 ; the maximum number laid by a single female in 24 hours was 10. Females seemed to feed as much after the cessation of reproductive life as during the period of egg-production.

A. A.

HALL (Maurice C.). **Lesions due to the Bite of the Wheel-Bug,** *Arilus cristatus* **(Hemiptera; Reduviidae).**—*Arch. Intern. Med.* 1924. Apr. 15. Vol. 33. No. 4. pp. 513–515.

A good many species of Reduviid bugs are known to have inflicted painful bites on man, bites causing local inflammation, vesiculation and often even ulceration, and sometimes numbness and symptoms of shock. In the case here recorded the bite of a Reduviid, *Arilus cristatus*, was followed by a local growth of small papillomata.

A. A.

PAVLOVSKY (E. N.) & STEIN (A. K.). *Maculae coeruleae* **and** *Phthirus pubis*.—*Parasitology*. 1924. Mar. Vol. 16. No. 2. pp. 145–149. With 5 text figs. [11 refs.]

The blue spots caused in the skin by the bites of the crab-louse are the effect of a ferment, emanating from the insect's bean-shaped salivary glands, which appears to act upon the haemoglobin. The secretion of the horse-shoe shaped salivary glands has no such effect.

A. A.

FLETCHER (T. Bainbrigge). **Intestinal Coleoptera.**—*Indian Med. Gaz.* 1924. June. Vol. 59. No. 6. pp. 296–297.

There seems to be no doubt that in lower Bengal and the low country of Ceylon beetles do actually get into the bowel of young children and give rise to diarrhoea and gripes, perhaps leading to emaciation. These beetles belong to the Coprine sub-family of the Scarabaeid family and the species so far recognized are *Onthophagus bifasciatus* and another undetermined species of Onthophagus, and *Caccobius mutans*. How they get into the child's gut is at present a matter of conjecture; the author rather inclines to the opinion, based on the habits of the beetles and on the fact that only adult beetles have been passed, and also on the circumstances of the children, that they creep in through the anus when the child is asleep.

A. A.

BISHOPP (F. C.). **The Puss Caterpillar and the Effects of its Sting on Man.**—*U.S. Department of Agric. Department Circular 288.* Washington, D.C. 1923. Sept. 14 pp. With 12 figs. [5 refs.].

This is a full description of the "puss caterpillar" (*Megalopyge opercularis*) in all its stages. According to the author the urtication which it causes is due not to the tussocks of hairs that cover the body, but to short spines disposed on tubercles beneath the hairy coat. Contact with these spines is followed by burning pain, a papular rash which may be accompanied with much swelling, numbness, and sometimes paresis, nausea and vomiting. The severity of the symptoms depends upon the size of the caterpillar. Fresh-moulted skins and fresh-killed caterpillars will also cause mild irritation, and even the cocoon. The bacterial and Tachinid-fly parasites of the caterpillar are described.

A. A.

CLEVELAND (L. R.). **The Physiological and Symbiotic Relationships between the Intestinal Protozoa of Termites and their Host, with Special Reference to** *Reticulitermes flavipes* **Kollar.**—Reprinted from *Biological Bull.* 1924. Apr. & May. Vol. 46. Nos. 4 & 5. pp. 177–225. [70 refs.]

This paper may be commended to the notice of the medical profession in the tropics (where the material for experiment is so abundant and so ready) for its suggestive biochemical and other interest. It is fairly well known that the great majority of termites feed principally on wood, many of them on dry wood, and that in their intestine they harbour enormous numbers of protozoa, chiefly flagellata, with a wonderfully differentiated cytoplasm. The protozoa do not occur indiscriminately, but in generic and specific correspondences with their hosts, though one host-species may harbour several protozoon-species simultaneously. The almost obvious inference that the protozoa must be necessary to the termites, that they must perform some vital function for their hosts, probably that of digesting dry cellulose, has gradually been finding clearer expression (see this *Bulletin*, vol. 19, p. 465), and the present author now furnishes experimental proof, based on a careful investigation on one species of termites, that this inference is correct, and that these intestinal protozoa are the very pith of life for the termites that harbour them. He found (1) that he could destroy all the protozoa in an individual termite host, without immediate injury to the host, by incubating the individual for 24 hours at 36° C.; (2) that a termite so deprived of its intestinal protozoa died within 10–20 days if it were fed on its normal diet of wood, but (3) would live on indefinitely if it were fed on digested wood (in the form of humus or fungus), and (4) that if it were re-infected with its protozoa it could live on indefinitely on the ordinary diet of wood.

A. A.

WALCH (E. W.). **Over de Trombiculae, welke de Pseudotyphus overbrengen, en na verwante mijten uit Deli (2e mededeeling).** [On the Trombiculae which transmit Pseudotyphus, and Closely Related Mites in Deli, E. C. Sumatra (2nd Communication).]—*Geneesk. Tijdschr. v. Nederl.-Indië.* 1924. Vol. 64. No. 3. pp. 499-530. With 26 figs. [11 refs.]

Walch describes in detail the nymph stage of some of these parasites (*T. Schüffneri, Deliensis, pseudoakamushi, muris, Oudemansi*), and adds the description of 2 new species (*T. Keukenschrijveri* and *vara*).

W. J. Bais.

BISHOPP (F. C.). **The Rat Mite attacking Man.**—*U.S. Department of Agric. Department Circular 294.* Washington, D.C., 1923. Oct. 4 pp. [1 ref.]

Liponyssus bacoti, a common rat-mite, is known to attack man. In the circumstances here reported—namely, an unusual increase of rats in the city of Dallas, in Texas—this mite extended its attention to man to such an extent as to be a pest.

A. A.

PARKER (R. R.), SPENCER (R. R.) & FRANCIS (Edward). **Tularaemia. XI. Tularaemia Infection in Ticks of the Species *Dermacentor andersoni* Stiles in the Bitterroot Valley, Mont.**—*Public Health Rep.* 1924. May 9. Vol. 39. No. 19. pp. 1057–1073. [6 refs.]

Bacterium tularense has been recovered from unfed adult ticks, of the species *Dermacentor andersoni,* collected in nature in western Montana; the inference, therefore, is certain that infection must have been acquired in one of the antecedent stages of the ticks, and this must have been about 8 months before, and anterior to, hibernation. Subsequent experimental work showed that larvae of *Dermacentor andersoni* infected from a guineapig were subsequently infective in their nymph stage and in their adult stage. This tick therefore must be one of the agents that maintains the existence of *B. tularense* and also—assuming that the virulence of the bacterium is not diminished by long survival in the tick—of tularaemia.

A. A.

TOMB (John W.). **The Treatment of Scorpion-Sting.**—*Trans. Roy. Soc. Trop. Med. & Hyg.* 1924. Feb. 21. Vol. 17. No. 8. p. 520.

The author has treated many cases of scorpion sting, in India, with liquor ammoniae fortis (B.P.), and he has found that the local application of a drop or two gives immediate and permanent relief from pain.

A. A.

MESSINGER (Karl). **Ein Blutegel im Kehlkopfe.** [A Leech in the Larynx.] —*Med. Klin.* 1924. June 15. Vol. 20. No. 24. pp. 825–826.

A homely and picturesque, if somewhat prolix, account of a countrywoman who had accidentally imbibed a leech six days before she was brought to the writer. She had been incessantly choking and coughing up blood all that time and she was in a state of livid pallor and utter collapse when brought in. Owing to the blood and the incessant spasmodic cough location of the leech—beneath the vocal cords—was difficult, and extraction—under cocain—extremely precarious. Forceps could not keep hold of the slippery beast, and when at last it was loosened by the application of a tampon soaked in strong solution of salt, it fell into the trachea. Then, with an explosion that made the patient's eyes bulge, and nearly choked her, it was shot out in a gush of blood. Coughing continued for a short time and a few clots were brought up, but a little morphia finally gave relief.

A. A.

FORNARA (L.). **Note sur un cas de localisation sous-arachnoidienne d'une larve de Porocéphale.**—*Ann. Soc. Belge de Méd. Trop.* Brussels. 1924. Jan. Vol. 3. No. 3. pp. 233-236.

This is a report of a case which in life, as in its post-mortem revelations, was a typical acute meningitis, the subject being a native African boy of 14 years. The only peculiar circumstance was the occurrence, in a string of purulent fibrin adherent to the convexity of the right occipital lobe, of a larva of *Porocephalus* (*Armilliger*) *armillatus*, 78 mm. in length, the causal relation of which to the sero-purulent meningitis is, as the author more than hints, a matter of argument.

This is the third case of parasitism of Porocephalus in the human subject that the author has encountered, the other two being abdominal.

A. A.

ESCOMEL (Edmundo). **Parasitologia de Arequipa y sus alrededores.** [Parasitic Affections of Arequipa and its Environs.]—*Cronica Méd.* 1924. Feb. & Mar. Vol. 41. Nos. 728 & 729. pp. 37–44 ; 72–78. With 9 text figs.

The author gives in these two papers brief accounts of parasitic conditions met with in man and animals in Arequipa (7,600 feet) and its environs. The fact that in fifteen pages he deals with trematodes, cestodes, nemathelmia, mites, bugs, fleas, ticks, mosquitoes, simuliidae and tabanidae ; also with mycoses and mycetomas, telosporidia and sporothrices, is sufficient to indicate that the information regarding each is somewhat meagre.

Fasciola hepatica is very common in sheep but no case has been met with in man ; *Taenia solium* and *T. saginata* both occur and *Coenurus cerebralis* is seen at the slaughter-house. Of the nematodes Ascaris and Oxyuris are fairly common in man, and Belascaris and Toxascaris in the cat and dog respectively. Necator is said not to exist because the climate will not permit of its development ; the absence of Trichuris is ascribed to the same cause. Strongyloides infection, however, is frequent and is said to be the cause of cyclical diarrhoea.

Of Arthropods mention is made of *Demodex folliculorum* var. *hominis* and *Sarcoptes scabiei*. *Ornithodorus megnini* is met with frequently in the external auditory meatus. Reduviid bugs are from time to time introduced by travellers but do not propagate. To the relative freedom from *Pulex irritans* the author ascribes the absence of plague from Arequipa. Culex and Anopheles come up from the valleys by train, but being unable to adapt themselves to their new surroundings they perish a short distance from the railway and do not cause disease in man. With the exception of a brief record of three cases of actinomycosis of the lung, all terminating fatally, the remaining part of the papers contains little of interest.

H. Harold Scott.

NUTTALL (George H. F.). **The Anomalous Position of Parasitology in the Medical Curriculum in England.**—*Parasitology.* 1924. Mar. Vol. 16. No. 2. pp. 248–250.

Here are to be found some trenchant remarks upon the ignorance of parasitology (bacteriology excluded from the charge) prevalent in the medical profession. The generality of medical students learn next to nothing of it beyond what they pick up in their preliminary course in zoology, and even the professionally-qualified men who take the courses for the D.T.M. & H. cannot learn much in the short statutory courses provided. The remedy here proposed is that a course of instruction in parasitology should be included in the ordinary curriculum of the medical schools : the course must have its limits, but the student should at least learn how to collect and preserve material and how to prepare films and specimens of faecal and other discharges.

A. A.

FARAKER (Erskine). **Anaphylaxis to Antivenom Serum.** [Memoranda.]—*Brit. Med. Jl.* 1924. Apr. 5. p. 626.

In this case an Indian lad having been "bitten by something" and ten minutes afterwards received an intravenous injection of Kasauli antivenom, immediately collapsed. He became extremely agitated, thirsted for air and for water, complained of burning chest and epigastrium, swelling of eyes and throat, and tingling all over the body. The pulse could not be felt and the respiration increased to 60. After appropriate treatment, which included adrenalin, digitalin, and strychnine, he slowly recovered, the axillary pulse not being palpable for more than two hours and the radial for more than three. The antivenom came from a batch of ampoules one of which had been used only a few days before with entirely satisfactory results.

A. .A.

FERRI (Giorgio). **Esperienze sul morso e l'avvelenamento viperino.** [Observations on the Bite and the Venom of the Viper.]—*Bol. d. Istituto Sieroterap. Milanese.* 1924. May. Vol. 3. No. 3. pp. 191–195. English summary p. 195.

There is nothing novel in this paper beyond the experimental observations that the ripe sporiferous tissue of the field mushroom is toxic when injected subcutaneously, and the verification by the author of the observation of PHISALIX that the injection of the watery extract of this mushroom-tissue imparts to laboratory animals a slight degree of immunity to viper venom.

A. A.

BLACKLOCK (B.). **Larva of the Tumbu-Fly** *Cordylobia anthropophaga* **in the Lower Eyelid.** [Miscellanea.]—*Ann. Trop. Med. & Parasit.* 1924. Aug. 2. Vol. 18. No. 2. p. 239. With 1 plate.

BUXTON (P. A.). **A Key to the Fourth Stage** *Anopheles* **Larvae of Palestine.**—Reprinted from *Bull. Soc. Roy. Entom. d'Egypte.* 1923. Feb. 14. pp. 45–50. With 6 text figs.

CHALON (G.). **Présence d'***Ornithodoros Savignyi* **(Audouin) à Ouargla (Sahara algérien).**—*Bull. Soc. Path. Exot.* 1923. Dec. 12. Vol. 16. No. 10. pp. 741–742. [6 refs.]

CHARRIER (H.). **Les moustiques de la région de Tanger (Maroc).**—*Bull. Soc. Path. Exot.* 1924. July 9. Vol. 17. No. 7. pp. 570–572. [7 refs.]

DELANOË (P.). **Les diverses espèces de rats constatées dans les Doukkala et plus particulièrement à Mazagan. De la rareté du surmulot.**—*Bull. Soc. Path. Exot.* 1924. July 9. Vol. 17. No. 7. pp. 584–589. [1 ref.]

SINTON (J. A.). **Notes on some Indian Species of the Genus Phlebotomus. Part III. Provisional Diagnostic Table of the Males of the Species and Varieties recorded from India and Ceylon. Part IV.** *Phlebotomus himalayensis*, **Annandale 1910.**—*Indian Jl. Med. Res.* 1924. Jan. Vol. 11. No. 3. pp. 807–816. With 1 plate. [18 refs.] pp. 817–824. With 1 plate. [3 refs.]

TALIAFERRO (W. H.) & BECKER (Elery R.). **A Note on the Human Intestinal Amoeba,** *Dientamoeba fragilis.*—*Amer. Jl. Hyg.* Baltimore. 1924. Jan. Vol. 4. No. 1. pp. 71–74. With 2 text figs. [9 refs.]

YAWS.

ALDERSON (Harry E.). **[Report of a Case of Yaws in California.]**—*California State Jl. Med.* 1923. Apr. [Summarized in *Arch. Dermat. & Syph.* 1924. May. Vol. 9. No. 5. p. 623.]

From the title one might be led to believe that this note referred to an indigenous case of yaws ; it is, however, the first case of yaws diagnosed in California—a Filipino fireman on a ship who had become infected from the Filipino ship's cook. A point of interest is that the first eruption, that on the face, appeared while he was in England. There was general adenopathy and the Wassermann test was +++. Lesions showed the presence of *Sp. pertenue.* All the lesions rapidly disappeared after 3 doses of arsphenamin.

H. S. Stannus.

PENRIS (P. W. L.). **De frekwentie van framboesia en van positieve serumreactie (Sachs-Georgi) bij verschillende landaarden.** [The Prevalence of Yaws and of Positive Seroreactions (Sachs-Georgi) in Different Races.]—*Geneesk. Tijdschr. v. Nederl.-Indië.* 1924. Vol. 64. No. 1. pp. 48–58. [1 ref.]

Penris points out that in the Dutch East Indian army tertiary yaws is often confounded with tertiary syphilis. 775 native soldiers were questioned as to a history of yaws and examined for marks of this disease. 260 (33 per cent.) had certainly suffered from yaws before, 170 (22 per cent.) were suspicious in this respect, in 345 (44 per cent.) there existed no reason for such a suspicion. The greatest prevalence was found in Amboinese and Achinese soldiers. Accordingly, of 320 soldiers without syphilis in their history 42 per cent. showed a positive sero-reaction (Sachs-Georgi) (Amboinese 59 per cent., Achinese 71 per cent.). The author rightly insists that the value of the Sachs-Georgi test must be judged not by its degree of correspondence with the Wassermann test but by its clinical usefulness.

W. J. Bais.

ONG KIE HONG (H. F.). **Invloed van hooge koorts, veroorzaakt door pokken op framboesia tropica.** [Influence upon Yaws of High Fever in the Course of Smallpox.]—*Geneesk. Tijdschr. v. Nederl.-Indië.* 1924. Vol. 64. No. 1. pp. 181–182.

In two children of 6 and 8 years, suffering from smallpox, the pre-existing papular eruption of yaws dried up and healed during the convalescence from the smallpox.

W. J. Bais.

GUTIERREZ (P. D.). **Keratosis Palmaris et Plantaris due to Frambesia.**—*Arch. Dermat. & Syph.* 1923. Sept. Vol. 8. No. 3. pp. 382–392. With 10 text figs. [3 refs.]

Three cases are reported with a brief account of this complication occurring in 50 per cent. of cases attending the yaws clinic in Ilocos Norte, Philippine Isl. Two main lesions are described : (1) claviform keratosis, and (2) simple thickening of the corneal layer. Commencing as areas of hyperpigmentation on one or both palms or soles and extending peripherally, the hyperkeratotic lesions later show depigmentation and an appearance of leucoderma. The condition usually occurs from one to five years after the end of the secondary stage of the disease; the Wassermann reaction is variable. Histologically the changes are confined to the epidermis. Improvement in all cases is slow even under treatment with the arsphenamin preparations and iodides.

W. Jenkins Oliver.

NICOLAS (Felisa). [In English and Spanish.] **Notes on the Nose and Throat Manifestations of Tertiary Yaws. Manifestacions terciarias de la frambuesia tropica o bubas en la nariz y garganta.**—*Jl. Philippine Islands Med. Assoc.* 1924. Apr. Vol. 4. No. 4. In English pp. 140–142. In Spanish pp. 163-164.

The author briefly refers to the types of lesions met with among patients at the Manila Hospital dispensary, which occurring in the nose and throat could be diagnosed as framboesial. He mentions the ever-present impossibility of making a differential diagnosis between this disease and syphilis either clinically or by means of the Wassermann reaction and bases his diagnosis on the past history and the district whence the patient comes. The earliest lesion is probably an infiltration of the nasal septum, while the late stages go on to the condition known as rhinopharyngitis mutilans. Treatment by means of neosalvarsan is very satisfactory in the earlier cases. Potassium iodide is useful but much slower in action.

H. S. S.

i. DAVEY (J. B.). **Further Report upon Treatment with Bismutho Sodium and Potassium Tartrate.**—*Appendix No. iii.—Tanganyika Territory Ann. Med. Rep. for the Year 1922.* pp. 82–89.

ii. KENYA, Colony and Protectorate of. **Annual Report of the Bacteriological Laboratory for the Year 1922. Vol. XIII.** [KAUNTZE (W. H.). Senior Bacteriologist.]—p. 158; 200–201. With 1 chart.

iii. KENYA MEDICAL JOURNAL. 1924. Apr. Vol. 1. No. 1. pp. 25–26.—**Preliminary Report on a New Bismuth Preparation for the Treatment of Yaws.** [PUGH (J.)].

iv. ——. *Ibid.* pp. 26–27. With 1 plate.—**A Case of Para-Framboesia?**

i. The Principal Medical Officer of Tanganyika Territory refers to an attempt to prepare locally the double salt, sodium potassium bismuth tartrate, and the results obtained by its use in the treatment of cases of yaws. Now, at an interval of two years, the results mentioned have little value except perhaps to serve as a warning of the danger which may attend the use of locally prepared drugs of uncertain nature.

ii. In the second communication (pp. 200–201) V. H. KIRKHAM gives his experiences in trying to prepare the same double salt as first suggested by the Acting P.M.O. Tanganyika Territory and then gives a fairly detailed statement of the method now in use, which is quoted below:—

"Bismuth oxycarbonate is heated in a dish over a bare flame, and stirred until it assumes an orange colour indicating its conversion into bismuth oxide. Rather more than the theoretical quantity of tartaric acid required to convert this into bismutho-tartaric acid is added. Sufficient boiling water is then added to bring the mass into the consistency of a batter. It is placed on the water bath and stirred vigorously. In a few minutes the colour will commence to fade, and then quite rapidly it will turn white and almost solidify.

"When the reaction is complete the mass is transferred to a Büchner filter and drained at the pump. The excess of tartaric acid is removed by washing with a little hot water—bismutho-tartaric acid being only slightly soluble.

"The B.T. acid is then transferred to a dish, and treated with slightly less than the theoretical quantity of sodium hydroxide and potassium hydroxide in molecule proportions. It is most important that the alkalis be in solution of syrupy consistency, otherwise the reaction with the B.T. acid will be delayed. The reaction should be violent and hence the alkali be added piecemeal.

"When all has been added, the B.T. acid will almost have entirely disappeared into a syrupy solution with the reaction to litmus slightly acid. Filter off and concentrate the filtrate on the water-bath until a persistent film appears on the surface.

"Then pour into three volumes of alcohol and stir vigorously. In a few minutes the paste at the bottom will harden and crystallise. After standing for an hour or two the alcohol may be poured off and the crystalline mass broken up in a mortar.

"The powdered crystals may be then left under a small quantity of fresh alcohol for a further period, filtered at the pump, pressed, dried on porous tiles and finally in the steam oven.

"Simple as it may appear, and is with practice, there are several places where danger lurks. The crux is the amount of water. In no part of the procedure should more water be present then is necessary to bring the bodies into reaction. It does not enter chemically into the reactions required, but if a little too much is present, it appears to upset their course and bodies of lower bismuth content result. Also note that if even a slight excess of alkali be added, the salt will not crystallize out under alcohol, but the syrup remains permanently as such.

"It is essential that frequent analysis be made—in this department every batch is assayed.

"As Sod. pot. bismutho-tartarate is not decomposed by alkali the bismuth content may be obtained by titration with standard sodium sulphide solution, using sodium nitro-prusside as an outside indicator."

This is the preparation which has been so largely used in Kenya, the results of which were dealt with by Dr. GILKS [this *Bulletin*, vol. 21, pp. 364.]

The author of the Kenya Bacteriological Report also refers (p. 158) to the present impossibility of making a differential diagnosis between syphilis and yaws by means of serum reactions and then gives the comparative results in a small series of cases obtained by means of the Wassermann and Sigma tests, but it is not clear whether these were cases of yaws or syphilis.

iii. A short note giving the advantages and disadvantages of the treatment of yaws [37 cases] with a preparation of precipitated metallic bismuth in 50 per cent. glucose solution, each dose containing 0·2 gm. precipitated bismuth. [The method of preparation of the locally made drug, the details of making the injection, and the type of cases treated are not mentioned.]

iv. A clinical note upon a case which figures as the frontispiece of this new venture in medical journalism. The writer suggests that the lesions, including the absorption of the phalanges so that some of the fingers are "merely represented by small button-like bodies" are due to a para-framboesial affection of the nervous system. [In the absence of any other evidence than that produced the diagnosis would appear doubtful; no mention is made of leprosy.]

H. S. S.

i. Van den Branden (F.) & Van Hoof (L.). **Le tartrobismuthate de potassium et de sodium soluble et neutre dans le traitement des affections pianiques.**—*Ann. Soc. Belge. de Méd. Trop.* 1924. Jan. Vol. 3. No. 3. pp 327–336. [6 refs.]

ii. Van Nitsen (R.). **Le traitement du pian et la réaction de Bordet-Wassermann.**—*Ibid.* pp. 273–301.

i. The authors, having abandoned the use of a substance resembling Trépol on account of the pain produced locally by injection, give the results obtained since 1922 when the bismuth compound above mentioned was introduced. Sixty-four natives from the environs of Leopoldville were treated by intramuscular and intravenous injection of solutions containing from 1 to 4 per cent. of this salt, which contains 33·8 per cent. of metallic bismuth. The doses varied from 0·05 gm. for a child of 10–15 kilos to from 0·1 to 0·4 gm. for an adult, the total amounts given being from 0·15 to 1·5 gm. for a child and from 0·4 to 1·5 gm. for an adult. The immediate clinical results were good but cases passed out of observation immediately and the ultimate results of treatment as regards permanent cure and effect upon the Bordet-Wassermann reaction remain uncertain. Mild gingivitis and neuralgia of the mandibular branch of the trigeminal nerve were the only symptoms of intolerance noted.

ii. As the result of observations made on 50 cases during two years in Katanga (where yaws is uncommon) the author finds that tartar emetic is uncertain in its curative action (7 cases); stibenyl is useless (1 case); potassium iodide must be given over long periods and in large doses; arsenobenzol derivatives give the best results with a minimum total dose of 3·5 gm. or sulpharsenol 4·5 gm. [Bismuth was not used apparently.]

His conclusions with regard to the Bordet-Wassermann reaction in yaws are that no differential diagnosis can be made by this means between this disease and syphilis; the reaction becomes positive at an earlier stage in yaws than in syphilis; a negative may become a positive during treatment; the change from positive to negative as the result of treatment generally follows the disappearance of the clinical manifestations, but cases of persistent positive reactions were met with as in syphilis.

[No cases were traced over sufficiently long periods to really justify the inference of cure or permanence of the negative Wassermann reaction.]

H. S. S.

Danet & Beurnier. **Note sur le traitement du pian par les sels de bismuth.**—*Bull. Soc. Path. Exot.* 1924. June 11. Vol. 17. No. 6. pp. 502–503.

The authors report favourably on the results obtained by treating yaws (38 cases) with bismuth salts. Cure [by which is presumably meant disappearance of symptoms] was obtained in from 10–30 days, without any untoward symptoms. [No details given.]

H. S. S.

REID (C. B. B.). **Continuation Report on the Treatment of Yaws.**—*Appendix No.* iv—*Tanganyika Territory. Ann. Med. Rep. For the Year 1922.* p. 89.

In the district abutting on the north end of Lake Nyasa 800 cases were treated, some apparently with neokharsivan, but the majority with weekly intravenous injections of tartar emetic, with excellent results. Intramuscular injections of mercury cream were also given, but no reason is furnished. [Mercury according to the general consensus of opinion has no beneficial effect in yaws: on the other hand, it would be useful in cases of syphilis undifferentiated from yaws.]

H. S. S.

DYE (W. H.). **Comparative Results in the Treatment of Framboesia Tropica in Northern Nyasaland.**—*Jl. Roy. Army Med. Corps.* 1924. Apr. Vol. 42. No. 4. pp. 280–286.

After brief reference to the distribution of yaws in the North Nyasa district and to native nomenclature, the author states of the signs and symptoms of the disease as he met with it " these have not materially differed from the usual textbook description." He mentions that he saw only one instance of pitted palms among some hundreds of cases, but that dactylitis and a condition he refers to as pseudo-mycetoma are very common. He then deals with the comparative results of treatment by various drugs, the object of his investigation being to find an efficient method of treatment at small cost.

His findings are as follows:—

(1) Novarsenobillon: two intravenous injections of 0·3 and 0·6 gm. respectively, at a week's interval, gave good results, and no recurrences up to 12 months in secondary cases; in the tertiary disease a third injection of 0·6 gm. was necessary to effect good and rapid results.

(2) Galyl: three injections of 0·3 gm. at 4 day intervals for secondary cases and six injections for tertiary were satisfactory.

(3) Potassium iodide: one drachm thrice daily for 15 days in adults and in children 20 grains twice daily for three weeks effected a cure in secondary cases; for tertiary cases treatment had to be continued for two months.

(4) Castellani's mixture: this the author does not recommend.

(5) Antimony tartrate: daily increasing doses over five weeks gave only moderately good and somewhat erratic results in secondary cases, while with tertiary disease it was a useless method.

(6) Antimony and N.A.B.: this method allowed a saving of the more expensive drug but was only useful in earlier cases.

(7) Antimony and potassium iodide: in the same way a saving in iodide is made.

(8) Arsenobenzol and iodide of potassium: this combination gave the best results but is the most expensive.

A table of relative costs of treatment is given and the author's final conclusions are that for children pot. iod. is the most useful remedy; for adults he advocates novarsenobenzol and antimony as the routine method of treatment in secondary cases and pot. iod. or N.A.B. in fuller doses for tertiary cases.

[No statistics are given, so that the reader is unable for himself to judge of the results. Apparently, too, Captain Dye has not tried the treatment with bismuth salts which has been used with success and economy on a big scale in other East African colonies and elsewhere.]

H. S. S.

IKEGAMI (Yutuka). **[A Contribution to the Study of Immunity from Frambesia Tropica.]**—*Hifuka Kiyo* (*Arch. of Dermat.*) 1923. Nov. Vol. 2. No. 2. [Summarized in *Japan Med. World.* 1924. June 15. Vol. 4. No. 6. p. 134.]

The author reports two cases of framboesia in whom after cure of the initial lesions by salvarsan re-inoculation was negative.

[The inference is not clear, but the author appears to imply that the patients had developed an immunity to inoculated yaws, whereas on the analogy of syphilis it would seem more likely that both patients were not really cured but still suffering from the disease and therefore could not be re-inoculated.]

H. S. S.

SYPHILIS IN NATIVES OF WARM COUNTRIES.

NOGUE (M.). **La Syphilis chez les indigènes du Sénégal. La lutte contre la syphilis à Dakar.**—*Ann. d'Hyg. Publique, Industrielle et Sociale.* 1924. Mar. New Ser. No. 3. pp. 149–173. With 4 text figs. [40 refs.]

In this important paper, which everyone should read who is interested in the problem of syphilis among native races, the author as médecin-chef of the native hospital as well as of the venereal clinic at Dakar has been able to correlate two aspects of the problem, viz., the part syphilis plays in the causation of chronic disease which brings the native to the hospital and the type of syphilitic lesion for which he seeks treatment at the venereal clinic.

M. Nogue believes that the conditions prevailing in Dakar are a fair index of those to be found throughout Senegal and Soudan. Among patients under treatment for other diseases than syphilis and showing no signs of that disease the Bordet-Wassermann Reaction gave 52·77 per cent. positive results. This the author believes to be a correct indication of latent syphilitic infection, and it is interesting to note that he does not allow that malaria may be a possible factor in this high figure; even when the serum has been taken during the febrile stage he holds that it in no way interferes with the specificity of the reaction. Yaws is practically excluded—only four cases were seen in four years.

The primary chancre and early ulceration in the throat are but seldom seen, nor does the native seek treatment for mucous plaques and condylomata. The symptoms for which he does seek medical advice are the nocturnal headache and bone pains of the early tertiary period.

The clinical side is pretty fully dealt with, and the following points may here be noticed. Epitrochlear adenitis is considered an important sign. Contrary to what has been held by some European authorities, tertiary lesions are often multiple, pleomorphic and widely disseminated; cases may show evidence of visceral lesions and cutaneous manifestations at the same time.. Cardio-vascular syphilis, especially aortitis, is common, as is visceral syphilis generally; but considerable difficulty may exist in differentiating the various factors underlying some conditions where this disease co-exists with chronic malaria, with multiple helminth infection, ankylostomiasis, bilharziasis, with tuberculosis, with alcoholism, etc. Attention is also drawn to the probable part played by these other toxi-infections in determining the virulence of the syphilitic manifestations.

It is interesting to note that 11 cases of primary carcinoma of the liver were seen since 1919 [thus corroborating other observers as to the relative frequence of hepatic growth among native Africans.] Eight cases of juxta-articular nodules were met with, and in all these persons, with one doubtful exception, the presence of active syphilis was established. Cerebro-spinal syphilis was uncommon, occurring chiefly in the form of spastic paraplegia and hemiplegia, but no case of tabes, general paralysis of the insane or Argyll-Robertson pupil was seen. Miscarriage and premature death among infants, due to the disease, are common.

Among 850 children in public schools, 6·8 per cent. showed evidence of hereditary syphilis. Interstitial keratitis is rare, as also are cutaneous lesions among these cases; the commoner signs are coryza, rhagades, enlargement of spleen and liver, osteitis and arthritis, hydrocephalus. It is probable, too, that the disease is very often acquired during childhood. No details are given of the routine treatment adopted, but novarsenobenzol, mercury, bismuth and potassium iodide are mentioned.

The author refers to the difficulties of coping with this scourge but looks forward with hope to good results in the future.

H. S. Stannus.

Bartholomew (R. A.). **Syphilis as a Complication of Pregnancy in the Negro: Analysis of Three Hundred Cases; Results of Antisyphilitic Treatment; Dark Field Examination as Aid in Diagnosis of Fatal Syphilis at Necropsy.**—*Jl. Amer. Med. Assoc.* 1924. July 19. Vol. 83. No. 3. ppl 172–174. [13 refs.]

A paper giving the observations made by the author at the prenatal clinic and lying-in hospital of the Emory division of the Grady Hospital, Atlanta, which is best epitomized in his own summary:—

"A comparison of the pregnancies of 100 non-syphilitic, untreated syphilitic and treated syphilitic patients, respectively, taken from a clinic in the south-east in which at least one third of the patients are syphilitic, showed three times as many abortions and premature labors and seventeen times as many stillbirths in the syphilitic as in the non-syphilitic: prenatal treatment with an average of 1·14 gm. of arsphenamin and 0·04 gm. of mercuric salicylate from an average of 7·4 months on to term, resulted in one half as many premature births, one third as many stillbirths, one seventh as many abortions, and one ninth as many infant deaths up to ten days, as in the untreated cases.

"The dark field examination of a suspension of liver tissue obtained at necropsy or aspirated from the liver is a valuable aid in diagnosing syphilis in babies stillborn or dying after birth, and was in agreement with the maternal Wassermann reaction in from 65 to 70 per cent. of the cases. This procedure may show the presence of spirochetes when all other evidences are lacking, but failure to find the organisms does not prove the absence of syphilis."

H. S. S.

Decrop & Salle. **Accidents et résultats de la médication arsénobenzolique intra-veineuse. A propos de dix mille observations recueillies au Dispensaire Antisyphilitique de Fez.**—*Ann. des. Malad. Vénériennes* Paris. 1923. Dec. Vol. 18. pp. 897–923. With 3 plates. [2 refs.]

The value of these observations lies in the fact that they refer to large numbers—ten thousand individual cases of syphilis and close on eighty thousand intravenous injections. The drug used was novarsenobillon except during part of last year when rhodarsan was introduced. A progressively increasing dosage was employed given in concentrated solution. All cases were controlled by the Wassermann reaction and complete records kept.

The untoward results, which were observed and carefully recorded, are divided into three groups.

A. Reactions due to the disease: focal reactions 29; apoplectiform stroke 3; abortion 4; early jaundice, which cleared up under further treatment, 6.

B. Reactions due to intolerance:—nitritoid crises 84; later generalized symptoms 114; various skin eruptions 60; rapid spread of pyogenic infections of the skin 15.

C. Toxic reactions due to the drug used:—four cases of nitritoid crises occurred in patients treated with a certain batch of N.A.B. who exhibited no unusual manifestations under previous and subsequent treatment by other batches of N.A.B.

The three cases designated under apoplectiform stroke occurred in patients suffering from neurosyphilis, and all were fatal, but these were the only mortal accidents in the whole 10,000 cases. In only eight cases was it necessary to discontinue treatment by N.A.B. and in only four was treatment by these preparations unsatisfactory.

There is little reference to the clinical side, but the frequency of extra-genital chancre, of infection during childhood, of the disease being transmitted to many members of a family is noted, and attention is called to the preponderance of skin, gland, bone and joint lesions and to the invisible transformation of secondary into tertiary manifestations.

The results of this crusade against syphilis in Morocco, where 75–80 per cent. of the population is infected, are already visible in the comparative rarity of those gross lesions which were so common a few years ago.

H. S. S.

HAZEBROEK (F. E. A.). **De klinische beteekenis van den uitslag van het serologisch onderzoek.** [The Clinical Significance of the Result of Serologic Examination.]—*Geneesk. Tijdschr. v. Nederl.-Indië.* 1924. Vol. 64. No. 1. pp. 116–150.

Hazebroek emphasizes the shortcomings of the serological syphilis diagnosis and supports his opinion by quotations from various writers on this subject. The faults of technique that give rise to mistakes are discussed in detail. Stress is laid upon the necessity of considering before all the clinical aspect of a case and to treat the syphilis and not the Wassermann test. The writer gives his personal experience of the Sachs Georgi test and the formol test of Gaté and Papacosta, not of the Wassermann test. Both tests are in his hands more sensitive to latent yaws than to latent syphilis, which renders a positive reaction in the tropics far less important than it is in Europe.

W. J. Bais

DE FREITAS (Q. B.). **The Wassermann Reaction in the Diagnosis of Mental Diseases of Syphilitic Origin.**—*British Guiana Med. Ann. for 1923.* pp. 68–70.

The author gives a list of 55 persons "suffering from various types of insanity," upon whom Wassermann tests were made during the years

1913–15. [No mention is made of which types of cases gave positive, negative or doubtful results.]

H. S. S.

MEDICAL RESEARCH COUNCIL. Privy Council Special Report Series No. 78. **The Serum Diagnosis of Syphilis. The Wassermann and Sigma Reactions compared.**—171 pp. With 7 figs., 19 graphs and 15 charts. 1923. London: Published by H.M. Stationery Office. [Price 5s. 6d.]

This paper cannot be summarized: one can give only an indication of its scope and quote some of its contributors' (independent) conclusions; they are of the greatest importance to pathologist and clinician.

Part I (A) consists of an analysis of the results obtained in the comparison of the Wassermann and Sigma Reactions in the same serums: 894 specimens of serum from 571 individuals. The authors conclude that:

(1). An approximately equal number of positive results is obtained by these two reactions in untreated cases of manifest syphilis.

(2). In treated cases the Sigma reaction gives a larger number of positive reactions than the Wassermann reaction; particularly obvious in cases giving small Sigma unitage.

(3). When results of the two reactions are expressed quantitatively they do not in some cases run parallel; although there is usually a rough correlation between both strong and weak reactions with each test.

(4). In supposed non-syphilitic cases one or other of the reactions was positive on 7 occasions—in 4 of these both reactions agreed.

In Part I (B) technical methods of the Sigma (Σ) Reaction are fully and painstakingly described.

Part II consists of the details of a further comparison by other workers between results obtained by the Wassermann test of (a) HARRISON and (b) FLEMING, and by the Flocculation test (Σ reaction) of DREYER and WARD.

They conclude that: (1) the great majority of the results of the examination of 1,342 serums by the three methods show complete or almost complete agreement.

(2). Divergencies usually occurred in serums of low Sigma readings. It is a distinct advantage that the Sigma method assigns to such serums a definite value in units. A low Sigma reading does not prejudice the mind of the physician, and enables him to assess the value of the finding in conjunction with the clinical features of the case. By this technique the main errors of the Wassermann reaction, with its inconstant haemolytic system, will be avoided. Sometimes Sigma readings sufficiently high to warrant a diagnosis of active syphilis have been obtained while the Wassermann methods gave negative findings; in a few cases the very reverse occurred. Probably the reacting body concerned in the different tests is not identical in such cases. There is also a regular fall of the Sigma findings if treatment has been sufficient and continuous, and in many cases the Sigma readings persist longer than positive findings by the Wassermann methods. The regularity of the curve testifies to the accuracy of the Sigma technique, and the longer persistence to its greater sensitiveness.

(3). In non-syphilitic sera the Sigma technique seldom gives a positive reaction, while the other methods more often do.

(4). The Sigma technique gives a method of determining the progress of a case of syphilis under treatment, and the effect of various remedies on the Sigma readings—all which is impossible by any method not giving quantitative results.

(5). The Sigma findings seem to correspond in a remarkable way with the intensity of the clinical features of the disease and are sufficiently accurate for all clinical purposes.

(6). It is abundantly proved in this report that a negative finding by any of these methods does not warrant the conclusion that the patient is free from the disease.

(7). The value and accuracy of the Sigma findings depend on the constancy and the keeping properties of the antigenic solution and on the uniformity of the technique.

Finally, Part III gives the details and results, by yet other workers, of comparative tests of 1,500 serums by Wassermann (Harrison) and Sigma Reaction.

In these workers' opinions the chief advantages of the Sigma test are:

(1). Only two reagents are employed.

(2). Much information can be obtained.

(3). The reaction is *standard*, and comparable results can be secured by independent workers.

(4). It is simple and cheap.

(5). By its routine use treatment can be made less empirical and more suited to each case.

There are two disadvantages:

(1). It is more laborious for large numbers of reactions.

(2). More serum is necessary.

H. M. Hanschell.

STUART (George). **The Value of the Sachs-Georgi Reaction in the Serological Diagnosis of Syphilis.** —*Ann. Trop. Med. & Parasit.* 1923. Oct. 13. Vol. 17. No. 3. pp. 359–375.

This work was carried out in Palestine; the Wassermann technique was that of Boas. Dr. Stuart describes his own technique for the Sachs-Georgi reaction, and in this lucid and interesting paper gives analyses of his cases of syphilis and control cases, and discusses detailed results of the tests. Some of his conclusions, based on 1,037 examinations of serums, are:—

(1). Sachs Georgi cannot replace Wassermann reaction.

(2). Advantages of Sachs Georgi reaction are:—cheapness; simplicity; and the rapidity with which strongly reacting positive serums can be read.

(3). Sachs Georgi agreeing in 86–89 per cent. of cases with Wassermann reaction has a definite value. The patient's serum must be fresh and free from contamination with organisms. The reaction should not be employed in cases of acute infectious fever; and no opinion given on results of reaction unless a detailed history of the case accompanies the serum. [To the reviewer this appears to bring in clinical sanctions and by that much render laboratory tests superfluous.] And final opinions should be given only after 18 to 24 hours from the time the reaction was set up.

(4). These treated cases, controlled throughout a full course, tend to show the Wassermann reaction remaining positive longer than the Sachs Georgi. A negative Sachs Georgi therefore in a treated case would not give a reliable index as to cure of patient.

(5). The Sachs Georgi reaction remains negative in certain definitely established cases of syphilis; and this for no apparent reason. It is justifiable therefore to conclude that a negative Sachs Georgi reaction is of little or no value.

H. M. Hanschell.

BLACKWATER FEVER.

THOMSON (J. Gordon). **Researches on Blackwater Fever in Southern Rhodesia during the Years 1922 and 1923.**—*Proc. Roy. Soc. Med.* (Sect. Trop. Dis. & Parasit.). 1924. May. Vol. 17. No. 7. pp. 47–61. With 1 chart in text. [53 refs.]

The paper opens with a short historical account of the disease, from which it appears that the great majority of observers agree that blackwater fever is the result of severe malignant malaria especially associated with the tropics and in those areas where the endemic index is high. The unanimous opinion of medical men in Rhodesia is that blackwater is an end symptom of chronic neglected and improperly treated tropical malaria. In considering the co-relation of malaria and blackwater fever there are three factors to be investigated:—(1) The seasonal incidence; (2) the association of malaria parasites with the attack, and (3) the clinical history of malaria. The author's investigations showed that the relationship between malaria and blackwater as regards seasons is very definite. In all of the twenty-three cases examined by the author in Rhodesia before the onset of blackwater, *P. falciparum* was found. The parasites and also the pigment rapidly disappeared from the peripheral blood with the onset of haemoglobinuria. In three of six post-mortem examinations crescents were found in the internal organs. In 150 cases of blackwater fever in Rhodesia, a history was obtained of repeated attacks of malaria and of irregular taking of quinine.

All attempts to discover a specific causal organism such as the *Sp. biliohaemoglobinuriae* failed. Thomson mentions that he inoculated fifteen guineapigs from fifteen separate cases of blackwater in Rhodesia and that no symptoms appeared. Reference is made to the observations of BLACKLOCK (this *Bulletin*, Vol. 21, p. 62), who inoculated himself with the blood of a fatal case of blackwater.

The author was unable to discover any difference morphologically between the malarial parasites in blackwater fever cases and those occurring commonly in malaria in Rhodesia.

W. Yorke.

NIGERIA. **Annual Report on the Medical Research Institute for the Year 1922.** [CONNAL (A.), Director.]—40 pp. 1923. Lagos: Govt. Printer.

Reports have been received regarding 24 cases of blackwater fever (one had two attacks at an interval of 9 months) which occurred in Nigeria during 1922; there were several other cases, but details are not available: only three terminated fatally. Of the 25 attacks 22 occurred in men and 3 in women; 6 were in persons on their first tour, 6 on their second tour, 4 on their third, 2 on their fourth, 1 on his fifth, 2 on their seventh, 1 on his eighth and 1 on his ninth, respectively. There was a definite history of previous malaria in 22 cases, no records being available in three.

Details are given regarding the amount of quinine taken prophylactically by the patients. The author writes that the "data are of interest in so far as they show that in each instance the quinine used as a prophylactic failed in its object as shown by the previous tabular statement. It has to be emphasized, however, that very few took what is usually regarded as an adequate preventive dose. Even amongst those who claimed to have taken the regulation five grains per day, there is every likelihood that the actual time of day at which it was taken varied. There is every possibility, too, that the list includes persons who put all their trust in quinine and neglected other prophylactic measures, such as the wearing of mosquito boots."

Information is also given concerning the amount of quinine taken prior to the onset of the attack of blackwater. The author states that in no case was the dosage of quinine excessive, but that it was in fact singularly small in most cases and in two it cannot be regarded as the exciting cause of the blackwater. Clinical details are given of most of the cases. The duration of haemoglobinuria in those cases in which there were neither remissions nor relapses varied from 15 to 108 hours. Only one definite remission is noted; in this case the urine became darker again on the second day. There were one or more relapses in 8 cases and details are given. Of the three cases which terminated fatally, two died from cardiac failure on the third and eighth day, respectively, and the third from suppression of urine on the seventh day.

W. Y.

VAN HOOF (L.). **Spirochètes dans des accès de bilieuse hémoglobinurique chez des Européens au Congo belge.**—*Bull. Soc. Path. Exot.* 1924. Apr. 9. Vol. 17. No. 4. pp. 291–293. [1 ref.]

Reference is made to the claim of BLANCHARD and LEFROU (this *Bulletin*, Vol. 20. p. 138) to have discovered a small spirochaete in the blood of blackwater fever cases. At the Leopoldville laboratory the blood and urine of all cases of blackwater fever have during recent years been subjected to a minute search for spirochaetes. Details are given of a case of blackwater—a European aged 45—in whose blood numerous spirochaetes were found by the triple centrifugation method. On comparing them with a preparation sent by BLANCHARD the author is convinced of their identity. The patient contracted the disease near Stanley-Pool, from whence came the patients investigated by BLANCHARD and LEFROU. Inoculations of a guineapig and monkey were without result. Information is also given concerning two other cases of blackwater in whose blood the spirochaetes were found.

The following summary is given —

1. Amongst cases of blackwater fever some exhibited in their blood spirochaetes identical with those described by BLANCHARD and LEFROU.
2. The patients were infected in the same region as those observed by BLANCHARD and LEFROU.
3. Spirochaetes were not found in the urine.

W. Y.

MILLIEN (C.). **Considérations épidémiologiques sur la fièvre bilieuse hémoglobinurique.**—*Ann. Parasit. Humaine et Comparée.* Paris. 1294. Apr. Vol. 2. No. 2. pp. 169–171. [3 refs.]

In one of the villages of Mauritius containing a population of about 600 people of all races, the author records that numerous cases of blackwater had occurred in two houses, the one constructed in 1873 and the other in 1888. During the last twenty years, 10 new cases of blackwater and a number of relapses occurred in these two houses, whilst the total number of cases in the rest of the village did not exceed 15.

The two families which inhabited the houses in question did not suffer from malaria more than the other inhabitants of the village. In a table details are given of the incidence of the cases of blackwater in the two houses. From these observations it is concluded (1) that the frequence of blackwater is not correlated with that of malaria, nor is it influenced by such factors as ignorance, poverty, fatigue and alcoholism. (2) That the cause is perhaps a vector, which can live and reproduce itself for long periods in the same house.

W. Y.

LEFROU (G.). **Considérations sur la pathogénie de la fièvre bilieuse hémoglobinurique.**—*Bull. Soc. Path. Exot.* 1924. Mar. 12. Vol. 17. No. 3. pp. 218–227. [16 refs.]

This paper is a general summary of the pathology of blackwater fever along very similar lines to the critique published by the reviewer in a recent number of this *Bulletin* (Vol. 19, p. 631). The author deals particularly with two of the most important symptoms, viz., haemoglobinuria and jaundice.

In considering the question whether haemoglobinuria is dependent on haemoglobinaemia, stress is laid on the importance of careful observation, and various faults of technique are mentioned which might vitiate the conclusion. After summarizing the literature bearing on the subject, it is concluded that haemoglobinaemia is found in blackwater. Nothing, however, is known concerning the mechanism whereby the red cells are destroyed.

In order to explain the icterus of blackwater fever it is necessary to consider briefly the pathogenesis of the various forms of jaundice—

1. *Icterus from insufficiency of the excretory canals or from obstruction.* The biliary tubes are obstructed ; the liver, at first intact, becomes altered later. The urine contains pigment and bile salts ; the faeces are pale.

2. *Icterus from insufficiency of the blood or haemolytic icterus.* The biliary tubes are normal, the liver is normal, but the blood is changed. The red cells from some cause or other are destroyed in enormous numbers, the haemoglobin which is set free dissociates itself and the surcharged liver cannot eliminate the pigments. The urine contains a great quantity of urobilin, bilirubin is absent or exists only in traces, the bile acids cannot be found. The serum contains much urobilin and also normal bile pigments, but no acids. The stools are deeply coloured indicating an exaggerated elimination of bilirubin.

3. *Icterus from insufficiency of the liver.* The bile ducts and blood are normal, but the liver is changed. The jaundice is due to a functional disturbance of the hepatic cells which discharge no longer into the intestine, but into the blood, all or part of the biliary elements. The urine contains urobilin pigments and bile salts, but often there is an elective retention of one of the elements of the bile. The serum reflects the composition of the urine and the appearance of the faeces varies according to the degree of retention.

The three great icteric syndromes may not be pure and the jaundice may result from a combination of the different mechanisms, such as changed liver and blood for example.

After considering what is known regarding the condition of the blood and urine in blackwater fever, the author concludes that the icterus of blackwater may be due to a blood lesion or an hepatic lesion and certainly in very many cases to both at the same time. He points out that haemoglobinuria can occur without jaundice as in paroxysmal haemoglobinuria where icterus is very rare. The author believes that the hepatic lesion is due to the action of spirochaetes in some cases (this *Bulletin*, Vol. 20, p. 353) and in others to that of the malaria parasites.

Turning to a consideration of the part played by the spleen in blackwater, the author states that the function of this organ is two-fold; firstly in manufacturing new red cells and secondly in digesting the damaged cells. This double action results in the hypertrophy of the organ. The spleen may even play a much more important part, and numerous modern workers have suggested a pathogenic action of the spleen in haemolytic icterus; according to this theory the splenic reaction would be primary and not secondary to the blood destruction, the organ setting free the haemolysins. Such a theory merits the attention of those who are concerned with the pathogenesis of blackwater. [The paper is interesting and should be consulted in the original by those investigating blackwater fever].

W. Y.

PATERNI (Ludovico). **Contributo allo studio della emoglobinuria nei malarici.** [A Contribution to the Study of Haemoglobinuria in Malaria.]—*Policlinico.* Sez. Med. 1923. Nov. 1. Vol. 30. No. 11. pp. 543-569. With 7 figs. [69 refs.]

Details are given of three cases of blackwater fever. Two were young men and one a child of eleven. All were fatal and the postmortem findings are recorded. The author refers at considerable length to the literature on the disease. In only one of the three cases observed by the author was distinct haemoglobinaemia observed. It is to be noted, however, that only two of these cases came under observation during the actual passage of haemoglobinuria. The author summarizes his observations in some detail, and his chief points are as follows:—

> Two kinds of haemoglobinuria are seen; they are quite distinct, the first being found in malarial patients who have not taken quinine and the second in those who have taken quinine.
>
> Haemoglobinaemia is apparently rare; in the author's three cases there was a distinct leucocytosis with a predominance of monoleucocytes.
>
> The pathological lesions of the kidney do not consist merely in necrotic changes in the epithelium of the tubules, but sometimes distinct glomerular changes are seen, and, in addition, there may be sometimes interstitial infiltration. In fatal cases where death has occurred from anuria, casts are found in great numbers in the renal tubules; these may become less marked in cases where before death the anuria has shown signs of clearing.
>
> The author is of opinion that the casts are not the essential cause of anuria, but that this is more particularly due to a diminished secretion of fluid. The decreased renal flow is to be associated firstly with the lesions of the renal epithelium, and, more particularly, with the glomerular changes, and secondly, with the many extra-renal causes, such as vomiting, diarrhoea, etc.
>
> Red cells are to be found in the urinary sediment more commonly than is supposed.
>
> The specific gravity of the urine was low in the cases examined by the author; the amount of albumen was relatively slight.
>
> The haemoglobinuric kidney, so far as the author's observations go, clears up fairly rapidlv, and does not pass into a chronic condition.

W. Y.

LABORATORY METHODS.

NITZULESCU (Virgil). **Sur un nouveau milieu pour le montage des préparations microscopiques non colorées.**—*C. R. Soc. Biol.* 1923. Nov. 24. Vol. 89. No. 33. pp. 1065–1067.

The author finds an aqueous solution of sodium silicate (natrium silicium liquid. pur 1,400) a very useful medium for mounting unstained objects such as helminth eggs and arthropods. It is very cheap; will mix with water or caustic soda; hardens quickly without shrinkage; and is not affected by variations in temperature. Moreover, its refractive index is higher than that of Canada balsam, so that objects mounted in it are very well defined; another advantage is that old preparations can be cleaned off the slides merely by placing them in water. In mounting very delicate objects it is advisable to pass them through increasing strengths of the solution, and it is very necessary to avoid air-bubbles, as these are difficult to remove from preparations.

E. Hindle.

DSCHUNKOWSKY (E.). **Zur Frage der Aufbewahrung mikroskopischer Präparate.** [The Preservation of Microscopical Preparations.] —*Arch. f. Schiffs-u. Trop.-Hyg.* 1924. Jan. Vol. 28. No. 1. pp. 32–33. With 1 fig.

A simple method of preserving microscopical preparations, which should be of value on expeditions or in localities where it is necessary to protect slides against climatic changes.

The prepared slide is placed face upwards, and then covered with a clean dry slide so that the microscopical preparation is between the two slides. They are then placed on a thin layer of melted wax, in a thermostat or on a warm plate, and, owing to capillarity, the paraffin runs in between the edges of the two slides. Then the preparation is allowed to cool and subsequently dipped in melted paraffin, so that the two slides are coated with wax and the microscopical preparation between the two is protected against atmospheric or similar changes. When necessary, the two slides can easily be separated in order to examine the microscopical preparation.

E. H.

KLIEWE (H.). **Eine einfache und billige Methode der Spirochätenfärbung.** [A Simple and Cheap Method of staining Spirochaetes.] —*Muench. Med. Woch.* 1923. Dec. 14. Vol. 70. No. 50. p. 1486.

Films, fixed either by heat or in alcohol, are placed in a mordant consisting of a 0·5 to 1·0 per cent. aqueous solution of potassium permanganate for 1½ to 5 minutes, then washed in water and subsequently stained in a dilute solution of carbol-fuchsin (1 in 20) and finally washed in water and allowed to dry. Mouth and relapsing fever spirochaetes require 1½–3 minutes both in the mordant and in the stain; the syphilis spirochaete requires 3–5 minutes in the mordant (it is advisable to warm the solution gently), and the same time in the stain but without warming. With this method the spirochaetes are coloured light red and the background remains unstained, or takes only a faint rose colour.

E. H.

GILBERT (Ruth) & BARTELS (H. A.). **The Staining of *Treponema pallidum* in Dry Smears.**—*Jl. Lab. & Clin. Med.* 1924. Jan. Vol. 9. No. 4. pp. 273–275.

Of 12 simple stains tested for the examination of treponemata in dry smears, Fontana's method was found to give the highest percentage (64 per cent.) of positive results.

"1. Smears were air dried and fixed with Huge's fluid (1 cc. glacial acetic acid, 20 cc. formalin, and 100 cc. dist. H_2O) for one minute.

"2. They were next washed in water, then covered with mordant of 5 per cent. tannic acid in 1 per cent. carbolic acid solution, and heated until steam arose. The heated mordant was allowed to act thirty seconds.

"3. Smears were rinsed quickly in water, blotted and covered with a 2 per cent. ammoniacal silver nitrate solution.

"Heat was applied until steam arose and the heated stain was allowed to act thirty seconds.

"4. The specimens were finally washed, blotted and examined."

E. H.

GIEMSA (G.). **Zur Praxis der Giemsa-Färbung.** [Practical Directions for the Use of Giemsa's Stain.]—*Cent. f. Bakt.* I. Abt. Orig. 1924. Feb. 15. Vol. 91. No. 5. pp. 343–346. [6 refs.]

The author again calls attention to the necessity of an absolutely neutral medium in order to obtain successful results with Giemsa's stain, as the slightest trace of either acid or alkali interferes with the staining reaction. Distilled water usually contains carbon dioxide, which can be easily removed by boiling for a few minutes.

In addition it is necessary to employ a good quality of stain, and if pure glycerine is not available it is advisable to use the prepared solution in preference to the dry powder.

E. H.

NÖLLER (W.). **Eine halbtrockene Giemsa-Färbung für Darmflagellaten.** [A "Half-Dry" Giemsa Staining Method for Intestinal Flagellates.] – *Cent. f. Bakt.* I. Abt. Referate. 1924. Vol. 76. No. 9/10. pp. 239–240.

It is well known that intestinal flagellates cannot be satisfactorily stained by Giemsa's ordinary method, and wet films are difficult to prepare in the absence of laboratory accommodation. Consequently the following method will be of interest to workers in the field, as the author claims that it gives extremely good results with Trichomonas, Octomitus, Lamblia, and also with Sarcina and cultures of flagellates.

Ordinary films of the material to be examined are made on slides, fixed in either cold, or preferably warm, concentrated sublimate solution for 10–30 minutes, and then washed in gently running water for about 10 minutes. The slide is then removed from the water and allowed to drain, without letting the film dry, washed with physiological salt solution, and immersed in fresh, clear and sterile serum for about 5–15 minutes. The author employed horse serum, but probably any kind will serve. The slide is then taken out of the serum and allowed to dry, previously wiping off the serum from the back of the slide. When dry the film is fixed in absolute alcohol for 10–20 minutes, allowed to dry, and can then be stained in the same way as an ordinary blood film. The best results are obtained by staining with Giemsa for one hour or longer, rinsing the film in distilled water and again dipping it into serum. This quickly removes any excess of stain; subsequently the films are allowed to dry and may be examined in cedar wood oil, or mounted in Canada balsam.

E. H.

TWORT (Frederick W.). **An Improved Neutral Red Light Green Double Stain, for staining Animal Parasites, Micro-Organisms and Tissues.** —*Jl. State Med.* 1924. Aug. Vol. 32. No. 8. pp. 351–355.

For this the author recommends the employment of Grübler's Lichtgrün F. S. and Grübler's Neutralroth—a half-saturated solution of each in distilled water. The neutral red solution is placed in a large open dish and sufficient light green solution added to combine with it. If both solutions are previously heated to 40°–50°C., the resulting precipitate forms in large masses and can be easily removed without using a filter. The neutralization point between the two solutions is shown by the darkening of the mixture, resulting from the presence of small quantities of both dyes in the solution.

The precipitate is rinsed in distilled water, dried at 37°C., and can then be kept indefinitely. It is soluble in methyl alcohol, preferably with the addition of 5 per cent. glycerine, or in a mixture of 60 per cent. ethyl alcohol and 40 per cent. distilled water. 2·5 per cent. of glycerine may be added to the latter solvent, but is not essential. In order to prepare the solution, the dye is mixed with a small quantity of sand and triturated in a mortar together with the solvent, pouring off the solution and repeating the process as each portion becomes saturated. It is essential to obtain a saturated solution. Finally, the solution is filtered and kept in a stoppered bottle, in which it will keep indefinitely. (It may be obtained ready made from Mr. George T. Gurr, 136, New King's Road, Fulham, London, S.W. 6).

For staining sections two parts of the solution are mixed with one part of distilled water, but these proportions may be varied according to requirements. Stain for 5 minutes, or longer, with the sections face downwards in order to prevent the slight precipitate in the solution settling on the slide. Then rinse in distilled water; dehydrate in absolute alcohol, which at the same time differentiates and also removes any precipitate; finally pass through xylol and mount in balsam, or Gurr's neutral mounting medium may be employed.

If desired to stain dried films it is best to fix them in absolute alcohol, then wash in xylol and afterwards again pass alcohol over the slide. The film is then rinsed in distilled water and stained in the usual way, but it is preferable to employ a stoppered jar and allow the staining process to continue for some time.

The stain is said to give very good results with all kinds of tissues, which should be fixed either in alcohol containing 30 per cent. glacial acetic, or in Muller's fluid containing 10 per cent. formalin. Properly stained sections show at least five colours. The nuclei appear purple red or violet, mucous and colloid degeneration a very bright red, while foetal cartilage and other tissues are orange-red; fibrous tissues, etc., stain a bluish-green colour, and red blood corpuscles a lighter grass green. Micro-organisms stain bright red to a dark purple-red or violet, and stand out in marked contrast to the green-staining connective tissue surrounding them. The internal structure of animal parasites is also well shown. The stain is very selective in its action and leaves all tissues sharply defined.

When the stain is held easily in solution, as when mixed with little or no water, the green dye stains the denser; but the addition of water tends to put the stain in a supersaturated state, with slight precipitation, and causes the red dye to stain the denser. A minute quantity of acid increases the solubility of the dye, and alkali, such as ammonia, has the opposite effect.

[By attention to the simple directions for the use of Twort's stain very beautiful results can be obtained, especially with tissues, and it is a good stain to employ for the routine examination of pathological material.]

E. H.

MALE (A.). **Some Modifications of Staining Processes employed in Laboratory Work.**—*Jl. Roy. Army Med. Corps.* 1924. June. Vol. 42. No. 6. pp. 455–456.

The author first describes a method of counterstaining sections stained by Gram's method, which demonstrates both the nature of the tissue and also the presence of either " Gram-positive " or " Gram-negative " organisms.. Two stock solutions are required, a 0·5 per cent. solution of neutral red in 50 per cent. alcohol and a 1·0 per cent. solution of light green in water. To prepare the counterstain the light green solution is diluted to 0·1 per cent. and then mixed with an equal quantity of the neutral red solution.

The method of use is as follows :—

Bring section to water, then stain in 0·5 per cent. aqueous methyl violet for 1–2 minutes. Add Gram's iodine for 1–2 minutes, then decolorize with alcohol and wash in water. Counterstain for 3-5 minutes ; wash in water ; dehydrate with alcohol ; clear in xylol and mount in the ordinary manner. In the resulting preparation Gram-positive organisms appear blue ; Gram-negative, red ; the nuclei, red ; and the cytoplasm, connective tissue, muscle and blood-cells various shades of green.

The second method is a substitute for van Gieson's picro-fuchsin, which has the objection that the details of nuclear structure are often destroyed.

The stock solutions are a saturated solution of martius yellow in 50 per cent. alcohol and a 1 per cent. aqueous solution of acid fuchsin. 4 parts of the former are mixed with 6 parts of the latter and the resulting mixture diluted 1 in 4 with distilled water.

The method of use is as follows :—

Bring the section to water ; stain with Ehrlich's haematoxylin 10 minutes ; wash in tap water for 10 minutes ; counterstain 3 to 5 minutes ; then wash in water ; differentiate and dehydrate with alcohol ; clear in xylol and mount.

E. H.

i. CLEARKIN (P. A.). **Hints on the Collecting and Forwarding of Specimens for Laboratory Examination.**—*Kenya Med. Jl.* 1924. May & June. Vol. 1. Nos. 2 & 3. pp. 39–45 ; 75–78.

ii. ——. **The Place of the Laboratory in Clinical Medicine.**—*Ibid.* July. No. 4. pp. 107–112.

i. Short notes on methods of collecting and preserving morbid tissues and fluids for pathological examination. It contains nothing new.

ii. A useful article on the interpretation of laboratory results, written with the object of helping medical practitioners. It contains nothing original.

E. H.

WARTHIN (Aldred Scott). **The Molasses Plate Method for the Staining of Many Paraffin Sections at One Time.**—*Jl. Lab. & Clin. Med.* 1924. May. Vol. 9. No. 8. pp. 554–561. With 4 text figs.

An ingenious method whereby a large number of paraffin sections are held together in a celloidin sheet and stained at the same time. The original article should be consulted.

E. H.

LLOYD (R. B.) & CHANDRA (S. N.). **The Preparation of Permanent Stained Microscopical Specimens of Erythrocytes from Old Blood Stains.**—*Indian Med. Gaz.* 1924. Feb. Vol. 59. No. 2. pp. 81–82.

In medico-legal work it is often necessary to determine the nature of blood stains or clots that may be several months old. The authors find that by soaking in clear human serum for about one hour, with care to avoid evaporation, the clot becomes softened and can be transferred to a slide and stained in the ordinary way. With this technique it is possible at a glance to determine whether non-mammalian blood is present or not.

E. H.

HACKENTHAL (Hermann). **Eine modifizierte Schüffner'sche Blutfärbung.** [A Modification of Schüffner's Method of staining Blood.] —*Deut. Arch. f. Klin. Med.* 1923. Vol. 143. No. 5/6. pp. 276 286.

The author obtains better coloration of the leucocytes by employing staining methods other than the ordinary methylene blue of SCHÜFFNER'S original technique. (It may be recalled that Schüffner's solution consists of NaCl 4 parts, borax 0·1, phenol 3, and distilled water 1,000 parts.)

In the author's first method, which is recommended for general use, 2 cc. of this solution are mixed with 1–2 drops of a saturated aqueous solution of methylene blue and 1 drop of a similar solution of dahlia. Then 0·1 cc. of the resulting liquid is mixed with 20 cmm. of the blood to be investigated, by means of a haemoglobinometer. Slides are then prepared in the ordinary way, care being taken to employ vaseline to prevent the blood drying up, as it is necessary to leave the preparations for 30–60 minutes to allow the stain to act.

Particulars are given of the appearance of the various blood cells, and the author gives the normal relation of the leucocytes as follows: polynuclears 56–62; lymphocytes 27–32; large mononuclears 6–8; eosinophiles 1–3; basophiles and myelocytes 0–1 per cent.

To determine whether the leucocytes are acido-, neutro-, or basophile, 20 cmm. of blood is mixed with 0·1 cc. of the following staining solution:—1 cc. Schüffner, 4–5 drops of ripened methylene blue solution and 20 cmm. of HCl. The blood is then examined in the ordinary way.

Instead of methylene blue, thionin may be employed. 15 drops of a saturated aqueous solution are added to 1 cc. of Schüffner and the mixture filtered immediately before use. The subsequent technique is the same as that described above. Although useful for the small lymphocytes, this colour is not so reliable as methylene blue, as it produces degeneration of the leucocytes after a few hours.

A solution of thionin may also be added to an acid methylene blue preparation in order to accentuate differences in the staining reactions of the cells.

E. H.

DOLD (H.). **Ein neues Verfahren zur Konservierung (Ueberlebenderhaltung) von Blutzellen (Leukocyten, Erythrocyten, Blutplättchen) und anderen Körperzellen.** [A New Method of keeping alive Blood and Other Body-Cells in vitro.] *Klin. Woch.* 1924. Apr. 8. Vol. 3. No. 15. pp. 629–630.

The author has examined a number of fluids with the object of determining the best method of keeping blood elements and other body cells *in vitro*, and finds that ordinary serum is by far the best. The other fluids tested are arranged in descending order as follows:—citrate plasma; Ringer; thyroid solution; normosal; serum filtrate (filtered through collodion); and physiological salt solution, which was by far the worst.

The serum may be inactivated by heating to 56°C. for 30 minutes and is then kept sterile at a temperature of about 5°C. Leucocytes will keep their form for 8 to 9 days in this medium, and in one case well preserved cells were observed after 100 days. Blood platelets lasted for 2 or 3 days and were recognizable after 30 days, and other cells, such as spleen cells, spermatozoa, etc., all preserved their form and staining properties much longer in serum than in any other liquid.

E. H.

MASON (Edward C.) & SANDFORD (Arthur H.). **A Proposed Buffered Physiologic Salt Solution to be used in Serology.** —*Jl. Lab. & Clin. Med.* 1924. Feb. Vol. 9. No. 5. pp. 313–316. 2 refs.

The authors recommend the use of a buffered physiological salt solution for all serological work and propose one with the following composition: 7 gm. sodium chloride; 1·7 gm. of secondary sodium phosphate (with 2 molecules of water); and 0·2 gm. of primary potassium phosphate in each litre of double distilled water. This combination gives a solution with pH of 7·4 to 7·8 with a salt concentration of 0·89 per cent. and is stated to give uniform and constant results.

E. H.

ÉMILE-WEIL (P.) & LAMY (M.). **Sur une cause d'erreur dans la détermination des groupes sanguins due au vieillissement des sérums-étalons.** —*Bull. et Mém. Soc. Méd. Hôpit. de Paris.* 1924. June 19. Year 40. 3rd Ser. Vol. 48. No. 21. pp. 859–861.

Attention is called to the danger in transfusion of using standard sera that have been preserved for any length of time, as the agglutinating properties gradually alter. For example, serum belonging to Group 3, which should only agglutinate blood belonging to Groups 1 and 2, after being kept *in vitro* for two to four months agglutinated all four blood Groups. Similarly serum of Group 4 lost its property of agglutinating the blood cells belonging to Group 3.

It is important, therefore, in testing blood for transfusion purposes to employ serum that has been recently controlled, and the writers are of the opinion that this operation should not be carried out by the general practitioner, except in cases of emergency.

E. H.

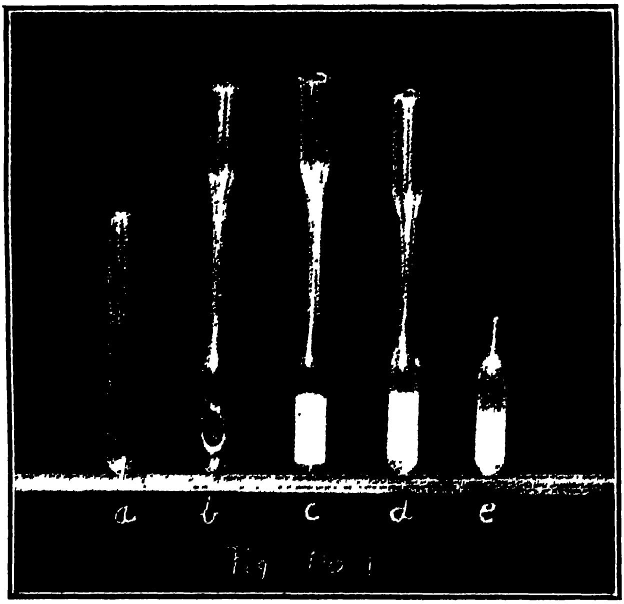
MALONE (R. H.). **A Simple Method of preparing Collodion Capsules for Use in the Study of Biological Problems.**—*Indian Jl. Med. Res.* 1924. Apr. Vol. 11. No. 4. pp. 1227–1230. With 1 plate.

The author describes an ingenious method of preparing satisfactory collodion capsules which will stand autoclaving without loss of permeability. These have remained in the peritoneal cavity of rabbits for more than three months without any evidence of leakage.

" The technique is as follows :—

" (1). Take a test tube that will furnish the desired size of capsule ; (the tubes used were miniature test tubes 7·5 cm. by 1 cm. (see Fig. 1a).

" (2). Heat the middle of the tube in the blow-pipe flame and draw out the glass so as to form a bulb, a neck and a mouth (see Fig. 1b).



Simple method of preparing collodion capsules by employing a small test tube with a " window " covered by the collodion membrane.

[Reproduced from the *Indian Journal of Medical Research.*]

" (3). Heat the side of the bulb portion over a limited area with a small hot blow-pipe flame. When the glass is red-hot, suck on the mouth of the tube so as to produce a bubble of glass within the tube. This either bursts spontaneously or can be broken up, forming a small oval window (see Fig. 1b).

" (4). Close the window thus formed by rolling a strip of thin cigarette paper around the tube, fixing it on with thin collodion (1 or 2 per cent. collodion in a mixture of 75 parts ether and 25 parts absolute alcohol)—see Fig. 1c. In applying the collodion, avoid the portion of paper overlying the window.

" (5). Allow to dry in air, and then dip the test tube into 12 per cent. collodion up to the lower end of the drawn-out neck and withdraw it slowly.*

" (6). Allow excess collodion to drain off for 30 seconds, holding the tube . . . in the ether-alcohol vapour above the surface of the collodion.

" (7). Dry in air for 1 minute.

" (8). Immerse in absolute alcohol for 5 minutes.

" (9). Wash off the alcohol in running water for a few minutes. The tube now appears as in Fig. 1d.

" (10). Immerse the empty test tube in water and test for leakage, gently applying pressure by means of a rubber teat attached to the open end.

" (11). Sterilization:

" Fill the prepared tube to the upper extremity of the drawn-out neck with peptone water. Place it in a larger test tube containing distilled water so that the level of the water in the outer tube is a little below the lower end of the neck of the inner tube. Plug both tubes with cotton wool and sterilise in the autoclave at 120°C. for 20 minutes.

" (12). After removal from the autoclave, examine the tubes and if there is no evidence of leakage, as shown by an alteration in the levels of the fluid, test the contents of the outer tube by the biuret test. A positive test indicates that the membrane is permeable.

" (13). The permeable tube may now be used for experiments in vitro by pipetting off the peptone water and replacing it with fluid, semi-solid or solid medium as desired.

" (14). If it is to be used for intra-peritoneal insertion, it is sown with the material under experiment, removed from the outer tube with sterile forceps and sealed in the flame (Fig. 1e)."

E. H.

CUNNINGHAM (J.) & TIMOTHY (B.). **A Comparison between the Numerical Content of Certain Bacterial Suspensions obtained by the Haemocytometer Method and Brown's Opacity Tubes.**—*Indian Jl. Med. Res.* 1924. Apr. Vol. 11. No. 4. pp. 1253–1258. [3 refs.]

The authors have prepared suspensions of all the commoner bacteria in varying concentrations so that they agreed with Brown's opacity tubes Nos. 1 to 10. The number of bacteria in each suspension was then counted by means of a haemocytometer. The results are given in tabular form and indicate the relation of opacity of various bacterial suspensions to the actual number of bacteria present.

E. H.

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* " The 12 per cent. collodion is prepared by dissolving 4 grams of dry necoloidin or Schering's celloidin in a mixture of 75 cc. ether and 25 cc. absolute alcohol, and evaporating down to one-third of the bulk.

" The dipping is carried out . . . . [in] a large test tube, 20 cm. by 4·5 cm., containing a sufficient quantity of the 12 per cent. collodion and closed by a bored rubber stopper. Through the hole in the stopper and moving freely in it is a glass rod, to the lower end of which is attached a small piece of rubber tubing, the glass rod and the tubing being large enough to fit snugly into the mouth of the test tube which is to be dipped, and serving as a handle.

" The tube is dipped once and withdrawn by a rotary movement of the handle. If this is carried out slowly and the tube as well as the collodion chilled in the ice-box beforehand, bubbles do not cling to the surface of the paper.

" During this dipping process the large test tube is kept tightly stoppered.

" When not in use, the collodion is kept in a tightly stoppered bottle in the ice-box to prevent evaporation."

NAPIER (L. E.). **The Preparation of N.N.N. Media of Different Hydrogen-Ion Concentrations.**—*Indian Jl. Med. Res.* 1924. Jan. Vol. 11. No. 3. pp. 733–736. With 6 figs.

In the preparation of N.N.N. media it is not practicable to add acid or alkali to the agar before it is sterilized, and therefore it must be introduced at the same time as the blood is added.

A carefully measured quantity of blood is added to each tube of agar, and then the required amount of sterilized acid or alkali solution, and the medium well mixed by rotation. All glass used should be first boiled in weak hydrochloric acid and then washed in distilled water.

The hydrogen-ion concentration of the medium gradually increases (from pH 7·7 to pH 7·0) until about the eighth day, after which it is almost constant. Therefore, in order to obtain media of known pH, it is necessary to make calculations on media of this age, and the author gives a series of useful graphs showing the pH thus produced by the addition of various quantities of acid and alkali.

E. H.

DUFFAU (H. E.). **Une nouvelle technique d'hémoculture.**—*Arch. Inst. Pasteur d'Algérie.* 1923. Dec. Vol. 1. No. 4. pp. 704–708. With 1 text fig.

Employing large test-tubes, ordinary agar slopes are prepared and then 10 to 15 cc. of bile, bouillon, or peptone water is added to each tube, so that when the tube is vertical part of the agar is above the level of the liquid. Then about 2 cc. of the blood to be examined is added and the tube incubated at 37°C. for 20 hours. When the culture is positive the organism grows on the surface of the agar above the level of the liquid and can be identified in the usual manner. The author claims exceptional rapidity in diagnosis by the employment of this method.

E. H.

PUNTONI (Vittorio). **Un metodo per l'isolamento in coltura dei protozoi dalle infusioni fecali.** [Separation and Culture of Protozoa from Faeces.]—*Policlinico.* Sez. Prat. 1924. July 28. Vol. 31. No. 30. pp. 965–966. With 4 text figs. [1 ref.]

The author suggests the following method for isolating single protozoa from faecal suspensions. A slide, 2 cm. by 6–7 mm., is marked transversely with a diamond. It is then sterilized by flaming and a loopful of the suspension is placed on one half and a larger drop of suitable nutrient medium on the other. The two drops are joined by a fine line drawn with a sterile needle. As soon as a protozoon is seen by a low power of the microscope to cross the bridge the slide is broken across and the capture dropped into the appropriate medium " whereby a pure growth from a single cell is obtained."

H. Harold Scott.

MALONE (R. H.). **An Examination of the Factors concerned in Neufeld's Bile Solubility Test.**—*Indian Jl. Med. Res.* 1924. Jan. Vol. 11. No. 3. pp. 867–876. [8 refs.]

——. **Degree of Bile Solubility as a Means of Differentiating Pathogenic from Non-Pathogenic Capsulated Diplococci.**—*Ibid.* pp. 877–881. [4 refs.]

i. The reliability of NEUFELD'S "bile solubility" test was investigated, employing 12 to 10 strains of capsulated diplococci obtained from the sputum of cases of lobar pneumonia and from the secretions of the naso-pharynx and tonsils of healthy throats. The author finds that the degree of solubility of the organisms is of great importance, and this can only be tested by performing the tests under uniform conditions.

The following suggestions are put forward and supported by tables of experimental results :—

"(1). Growths on solid media should be used in preference to those in fluid media and the organisms suspended in normal salt solution, thus ensuring that the suspension contains bacterial substance free from acid, extraneous protein, glucose, etc. The reacting fluid will then be alkaline on the addition of the solvent.

"(2). The solvent should be used in the same concentration for all tests, as the degree of solubility varies directly with the concentration of the solvent. Sodium taurocholate 1 in 10 has been found to be a satisfactory solvent.

"(3). The bacterial suspension must be kept constant as the degree of solubility varies inversely with the concentration of the bacterial suspension.

"(4). The temperature and time of the reaction should be kept constant. Half-an-hour in a water bath at 37°C. gives the best results.

"(5). The mixture of suspension and solvent should be alkaline.

"(6). A method of estimating the degree of solubility (*e.g.*, by means of opacity tubes) should be employed."

ii. Employing the bile solubility test the author tested various strains of Gram-positive diplococci by acting on them with 10 per cent. sodium taurocholate solution. Pathogenic strains tend to be either soluble or insoluble, whilst normal strains are intermediate in character, as shown by the following table :—

Degree of solubility (Opacity tube numbers).	Number of "normal" strains.	Number of pathogenic strains.
Less than 1 to 2	16	57
More than 2 to 3	4	10
,, ,, 3 to 4	0	1
,, ,, 4 to 5	1	0
,, ,, 5 to 6	5	0
,, ,, 6 to 7	1	0
,, ,, 7 to 8	8	0
,, ,, 8 to 9	20	10
,, ,, 9 to 10	3	8
	58	86

The pathogenic strains and members of Types I, II & III, tend to fall into the soluble group, while normal strains and organisms classified as Group IV. are to be found in both groups.

[The results obtained by the author suggest that with careful attention to detail, and in the hands of an expert, the bile solubility test may be of use in differentiating strains of diplococci. On the other hand, GLYNN and DIGBY* found that pneumococci from the same sample and of the same serological type may show differences in bile solubility.]

E. H.

CORNWALL (J. W.). **Changes caused by** *B. typhosus* **in the Reaction of Some Media.**—*Indian Jl. Med. Res.* 1924. Jan. Vol. 11. No. 3. pp. 839–844. With 1 chart. [1 ref.]

After describing the changes caused by the growth of *B. typhosus* in various media, attention is called to the necessity of examining control tubes that have not been inoculated. Clarified milk medium does not seem to change on incubation, but in the case of peptone water, glucose-peptone water and rabbit serum, respectively, at 37°C. changes towards acidity may occur after the media have been sterilized.

E. H.

KNIGHTS (E. M.). **Shipping Patients' Serums Long Distances in the Tropics for the Wassermann Test.**—*Jl. Lab. & Clin. Med.* 1923. Nov. Vol. 9. No. 2. pp. 125–127. With 3 figs.

The author found that by the method he describes contaminating bacteria are killed, while the serum is kept secure from other contamination during transit and arrives at the central Laboratory ready for testing—even after a 10 days' journey at "Mail pouch temperature" —Panama Canal Zone.

The golden rule is—sterility.

(1), Draw blood with sterile syringe.

(2). Place blood in sterile test tube ; slant and allow to clot.

(3). Break up clot with sterile glass rod.

(4). Centrifuge, or stand tube upright overnight (if possible in ice box).

(5). Sterile-pipette off clear serum, without disturbing the red cells, and place serum in sterile ampoule for inactivating.

(6). Inactivate in water bath at 55°C. for 30 minutes ; keeping ampoule always upright and the water well over neck of ampoule.

(8). Remove ampoule after 30 minutes and allow to cool to room temperature, keeping ampoule always upright.

(9). Seal off ampoule in flame, taking care not to heat serum.

H. M. Hanschell.

KORTHOF (G.). **Het verzenden of bewaren van Sera voor de Wassermann-Reactie.** [The Expedition or Storing of Sera for the Wassermann Test.]—*Geneesk. Tijdschr. v. Nederl.-Indië.* 1923. Vol. 63. No. 4. pp. 643–645.

The conclusion is :—

If there are less than four days between the time of collecting the specimen and the test, and the serum does not show signs of infection (smell of rotting, bacteria in a stained smear), the results may be relied on. In sera older than four days a positive result is unreliable. It is recommended to send whole blood and not serum as samples for the test, because repeated manipulations considerably increase the chances of infecting the sample.

W. J. Bais.

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* Medical Research Council, Special Report Series. No. 79. 1923.

ALTOUNYAN (E. H. R.). **Serum Diagnosis in Syria ; an Analysis of 2,868 Cases.**—*Lancet.* 1924. Jan. 12. pp. 73–76. [16 refs.]

(1). *Syphilis*: The author tested 1,783 serums by the Wassermann reaction (Rochester Row technique—presumably Harrison's method). He finds that while chronic malaria has no appreciable effect on the Wassermann reaction acute malaria does increase the anticomplementary power of serum giving " false " positives: non-malarial pyrexia has no effect on the Wassermann reaction.

227 cases were tested by Sigma reaction : (Dreyer Ward technique) ; one case, in this series, of leprosy gave a positive (2·6 units). He is of opinion that Sigma reaction is of as great diagnostic value as Wassermann reaction; in the study of syphilitics undergoing treatment Sigma reaction is the method of choice ; both Sigma reaction and Wassermann reaction should be used for the diagnosis of difficult cases. The possible influence on the Sigma reaction of malaria, leprosy and yaws requires investigation.

(2). *Tubercle.* C. F. T. Besredka Antigen; 501 cases. Cross-fixation phenomenon with syphilitic serums proved a serious factor in all tests, and four positives occurred in the course of typhus, typhoid, smallpox and " sleeping sickness " hyperpyrexia. On the whole, the author thinks, one is likely to get a strong reaction in an incipient case and a weak or negative reaction in a terminal case wherever the focus of the disease ; exceptions to this rule are, however, many.

(3). *Chronic Bacillary dysentery.* 181 cases. Standard agglutination tests with Shiga-Flexner group may be useful in determining the prevailing type of infection in the dysenterics of any given population.

(4). *Typhoid.* 107 cases. Where, as in Syria, typhoid is endemic, single agglutination tests are of value in diagnosis after the eighth day. Agglutination tests for the enteric group should be made with as many organisms of that group as possible.

(5). *Typhus.* Of 57 typhus patients examined by Weil-Felix Reaction (B. Proteus X 19) three proved negative ; one of these on the tenth day became positive. The earliest day on which the reaction was obtained was the fifth, the latest four weeks from onset. The highest effective dilution was 1 : 5,000, the lowest 1 : 50.

In this interesting paper Dr. Altounyan describes his careful technique and gives for each group of diseases his results in tabular form.

H. M. Hanschell.

KIRSCHNER (L.). **Over het verduurzamen van Bacteriën en van het Rabies-Virus-fixe.** [On the Conservation of Bacteria and of Rabies-Virus-Fixe.]—*Geneesk. Tijdschr. v. Nederl.-Indië.* 1924. Vol. 64. No. 2. pp. 193–204. With 1 text fig. [38 refs.]

By freezing and consecutive quick drying SWIFT (*Journ. of Exp. Med.* 1921, Vol. 33, 1) succeeded in bringing bacteria to a dormant state in which their virulence was preserved for years at room temperature. Kirschner modified SWIFT's apparatus [for the description of the instrument the original paper should be consulted], and describes the results of his experiments on this subject, especially in view of micro-organisms which are difficult objects of regular cultivation (pneumococcus, meningococcus, gonococcus). The cultures by this procedure change into a dry powder. After 2–5 months at room temperature in sealed tubes transfer the cultures to a suitable medium proved their viability. The virulence of rabies virus fixe preserved during 16 months in this manner had not decreased. Freezing or desiccation alone did not show any preserving influence. The author compares the dormant state of bacteria and the winter sleep of higher animals. He states that this method of preservation is of much importance for keeping micro-organisms in the tropics, especially rabies virus fixe and vaccine lymph. [On the latter, however, no experiments are mentioned in his article.]

W. J. Bais.

LABORATORY REPORTS.

Transactions of the Royal Society of Tropical Medicine and Hygiene. 1923 Dec. 13 & 1924 Jan. 17. Vol. 17. Nos. 6 & 7. pp. 337-345. **Laboratory Meeting.**

Ibid.—1924 Mar. 20 & May 15. Vol. 18. Nos. 1 & 2. pp. 1-12. With 2 charts & 5 figs.—**Laboratory Meeting.**

Many of the exhibits at the December meeting have been more fully described elsewhere, and therefore it is unnecessary to refer to them. Dr. Broughton-Alcock demonstrated films prepared from a catarrhal exudate from an antrum, which contained numerous spirochaetes and rare Gram-positive diplococci. The spirochaetes resemble *Spirochaeta buccalis*, and although these organisms have been observed by Ruth Tunnicliff in a frontal sinus, and have been considered as the causal agent in a few cases of rhinitis, this is the first record of their discovery in the antrum. Dr. Castellani exhibited specimens of dermatitis decalvans cryptococcica, showing the presence of a staphylococcus, a fungus, and a cryptococcus. The fungus is believed to be the cause of the condition, as staphylococcus vaccine has no effect, whilst potassium iodide in full doses has a very beneficial effect. Pruritus ani of mycotic origin was demonstrated, the fungi found belonging to the epidermophyton and trichophyton observed in dhobie's itch.

Colonel James exhibited specimens of parasites of inoculated malaria in England (in general paralytic patients) that had passed through 20 human hosts by direct inoculation. No morphological changes were observed although the virulence of the strain (benign tertian) seems to have been increased.

Professor Leiper showed specimens of Sparganum obtained from a mongoose. One other fed to a cat developed into a Diphyllobothrium, eggs of which were passed in the faeces. It is suggested that Sparaganum may be a normal phase in the development of certain species of Diphyllobothrium, which enters a mammal as the second intermediate host.

Dr. H. H. Scott exhibited a portion of the upper part of the intestine of a mouse, that had been fed with gravid segments of *Hymenolepis longior*, four days before being killed. Cysticercoids were seen in the villi. In another individual mature worms were found in the lower part of the intestine on the twentieth day after infection.

Dr. P. H. Manson-Bahr showed specimens of living embryos of *Filaria bancrofti* and *Loa loa* stained in vivo with 1 in 1,000 watery methylene blue (Sharpe's method). The advantage of this method of distinguishing the embryos was very evident in the two examples.

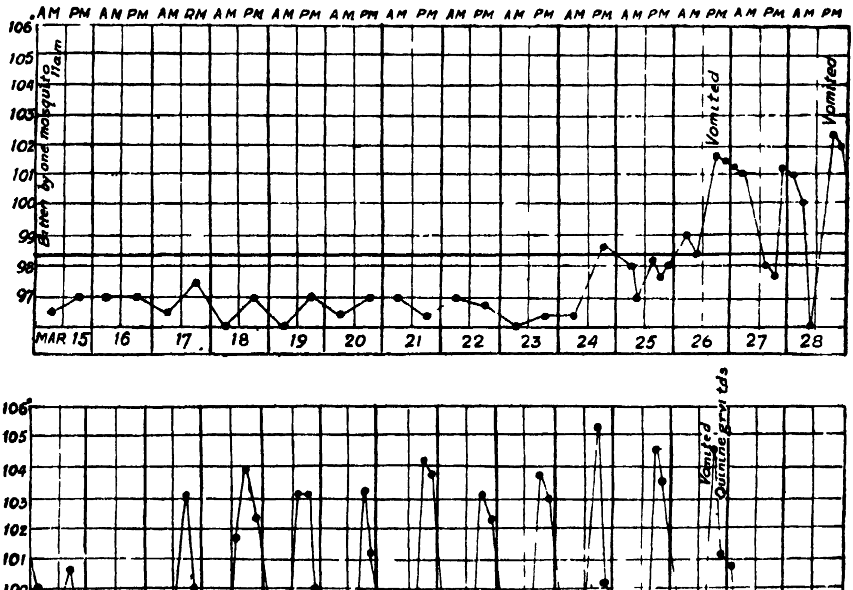
Dr. Newham exhibited a series of malaria slides from the Malay States showing, among other points, a film containing all three types of parasites in the same field ; also a red cell containing two sporulating subtertian parasites and another with a sporulating subtertian and one slightly less developed.

Wing-Cdr. WHITTINGHAM gave a table illustrating the differences between the three common species of *Phlebotomus* occurring in Malta, viz., *P. papatasii*, *P. perniciosus* and *P. minutus*, and stated that the first species is most common in open country, while the two latter are more prevalent in towns, etc.

Dr. H. M. WOODCOCK exhibited films of Rickettsia-bodies from normal lice and considers that these bodies are produced from pigment-grains when the latter happen to come under the influence of the auto-cytolytic action of desquamated cells which are breaking down in the lumen of the gut.

At the March meeting Dr. BROUGHTON-ALCOCK described the progress under treatment of a case of chronic macro-glossia, or pseudo-elephantiasis of the tongue, of mycotic origin. This case was described in the Transactions of the Society, Vol. xvii, Nos. 1 & 2, p. 5, and in the course of the past year continued progress has resulted from treatment (by Dr. CASTELLANI) with large doses of potassium iodide, and a vaccine and filtrate of a cryptococcus.

Colonel JAMES showed further specimens and charts illustrating naturally infected malaria in cases of general paralysis in England. In a memorandum it is recorded that in some instances the malaria induced by direct inoculation of blood is of a very severe type, with a



Temperature Chart of an infantile general paralysis patient (aged 13) bitten on March 15th by one *A. maculipennis* infected with a pure benign tertian strain which caused a quotidian type of fever.

[Reproduced from charts in *Trans. Roy. Soc. Trop. Med. & Hyg.*]

tendency to fatality, and this is believed to be a result of passing the parasite directly through many human hosts. When this strain was transmitted by means of its insect host there was no loss of virulence, but if anything the change was an increase rather than a diminution. The accompanying chart shows the course of the temperature of a boy aged 13, suffering from general paralysis, who was infected with benign tertian by the bite of one mosquito (*A. maculipennis*). It will be noticed that the type of fever is quotidian, although this was known to be a pure benign tertian strain of malaria. If a high temperature is desirable as a spirochaeticide, this strain is probably the most effective yet obtained.

Major S. ELLIOTT gave a comparison of various indicators for the presence of free chlorine in the sterilization of water supplies. Either barium or cadmium iodide mixed with starch, as in the preparation of the ordinary zinc iodide and starch solution, gave an indicator equally sensitive but with the advantage of being permanent. Both have withstood over three months incubation at 37°C. Ortho-toluidine, although more sensitive, is difficult for unskilled persons to use, as it gives a yellow colour which is difficult to detect, especially in waters naturally tinted yellow. Aniline hydrochloride gives an intense purple colour with free chlorine, but is much less sensitive than the above-mentioned indicators.

Major MANIFOLD described a case of human sarcosporidiosis. (See this *Bulletin*, this number.)

Lt.-Col. MARRIAN PERRY exhibited a case of extensive ulceration of the skin associated with a diphtheroid bacillus, which developed eighteen months previously after an operation for appendicitis. The isolated bacillus morphologically resembled that found to be the cause of the " desert " or " veldt " sores common in Egypt and Palestine during the war. It is agglutinated by the patient's serum and treatment by an autogenous vaccine produced beneficial results.

Dr. J. G. THOMSON showed a series of six blood films illustrating the malignant tertian parasite in the blood of malarial and blackwater fever cases in Rhodesia, and their cultivation. Eighteen to twenty hours after schizogony the infected corpuscles have a well marked altered staining reaction, indicating a chemical change, and in addition pernicious stippling appears. These altered red cells, acting as antigen, are supposed to be capable of producing haemolytic amboceptor, which will be specific to corpuscles so altered and not to healthy cells. After repeated attacks of malignant tertian the accumulation of these toxic substances finally result in haemoglobinuria. The cultures of *P. falciparum* showed the tendency of these parasites to clump round mononuclears.

Drs. WENYON and BROUGHTON ALCOCK describe, with figures, a Trepomonas, *T. agilis*, found coprozoic in a sample of mucus from a case of colitis. This is the first occasion on which this flagellate has been found in association with man.

Dr. WILLMORE exhibited sections of the intestine of a case showing a lymphosarcomatous growth, infiltrating the mucous and submucous layers. This patient presented symptoms closely resembling sprue, owing to the destruction of the absorptive surface of the ileum.

Mr. SAUNDERS showed photographs of *Aechmea* and *Vriesia*, two Brazilian Bromeliads which contain water and serve as the breeding places of numerous species of mosquitoes. In addition, stages of *Culicoides* (*Ceratopogon*). *varius* were shown. This is the minute

British blood-sucking midge which breeds in well rotted manure piles and in the flowing sap of wounded trees; there are several broods a year and they are especially troublesome in the spring, when the overwintering larvae transform into adults.

Mr. I. M. PURI showed specimens of *Simulium* reared by him in a specially constructed aquarium containing a very abundant air supply.

Dr. Andrew BALFOUR exhibited a cinematograph film illustrating the etiology, spread and prevention of malaria which had been prepared by the International Health Board of the Rockefeller Foundation. The first part of the film dealt with the effects of the disease and the method of infection; the second, with preventive work; and the third, with the results of antimalarial work. The educative value of such a film is very great, and it should be of considerable assistance for purposes of propaganda in countries where the inhabitants do not realize the importance of malaria in its effects on the economic welfare of the community.

E. H.

MANSON-BAHR (Philip). **On Laboratory Diagnosis in the Tropics and Sub-Tropics in War Time.**—*Jl. Roy. Army Med. Corps.* 1923. Nov. & Dec. Vol. 41. Nos. 5 & 6. pp. 321–333; 416–431. With 2 figs., 1 map & 3 charts.

This valuable article is based mainly on the author's experience, gained during the late war, in the Mediterranean and Egyptian Expeditionary Forces. In this region the two main diseases were malaria and dysentery, and the aim, as far as possible, was to get "early and accurate primary diagnosis and early and efficient treatment."

The greater part of the paper is concerned with the application of this principle in the main units of the Army Medical Service and proposals for the institution and organisation of a Diagnosis Unit. These proposals do not lend themselves to abstraction, and those interested should consult the original article.

In connection with the bearing of medical diagnosis on the military situation, attention is called to the supreme importance of malaria in the Eastern theatres of war. The difficulty of diagnosing this disease from clinical symptoms, in the absence of any blood examination, is shown by the following list of examples from the author's experience:—

SUBTERTIAN MALARIA.

1.—*Cases with Cerebral Symptoms.*

Preliminary or Provisional Clinical Diagnosis.	*Corresponding Clinical Type of Subtertian Malaria.*
"Sun-stroke" or "Heat-stroke."	Comatose or delirious type with hyperpyrexia.
Mental deficiency or mania.	Maniacal type of cerebral malaria with suicidal tendencies.
Epilepsy.	Cerebral malaria with epileptiform convulsions.
Cerebrospinal meningitis.	Cerebral malaria with spinal symptoms.

II.—*Cases with Abdominal Symptoms.*

Dysentery.	Abdominal malaria with passage of blood in stools.
Cholera or paracholera.	Choleraic or algid form with subnormal temperature and collapse.
Intestinal obstruction.	Clinical condition produced by blockage of intestinal capillaries by sporulating subtertian parasites.
" Appendicitis."	Abdominal malaria with pain and tenderness in the right iliac fossa.

III.—*Cases with Icteric Symptoms and Pain over the Hepatic Area.*

Jaundice, infective jaundice, cholecystitis, etc.	Bilious remittent form of subtertian malaria with vomit of bile.

IV.—*Cases with Pulmonary Symptoms.*

Bronchitis, pneumonia and pleurisy.	Malarial pyrexia with superadded pulmonary congestion, and cardiac distress due to malarial myocarditis. Pleuritic pain over the left hypochondrium being possibly caused by congestion and rapid enlargement of the spleen.

V.—*Cases with Nephritic Symptoms.*

" Acute nephritis " or " nephritis."	Subtertian malaria with general anarsarca and the excretion of albumin and sometimes blood into the urine.
Haematuria.	Methaemoglobinuria or blackwater fever.

VI.—*Cases with Skin Lesions.*

Purpura " Measles."	Septicaemic type of subtertian malaria with multiple cutaneous haemorrhages. These cases are rare, but two were encountered.

VII.—*Cases of Average Severity.*

(*a*) " Influenza " or " rheumatism."	Malaria pyrexia with arthritic pains.
(*b*) " Enteric," " sandfly fever," " trench fever," " relapsing-fever."	Average cases with pyrexia. Enlargement of the spleen not necessarily detectable.

VIII.—(*Sequelae*).

Cachexia and anaemia diagnosed as " pernicious anaemia," " leucocythemia," " debility."	Splenomegaly and great anaemia due to blood destruction.

The more important diseases of the Egyptian Expeditionary Force requiring a rapid laboratory diagnosis and the methods employed in forward units are outlined below.

Malaria. Thin films were always employed, as with these it is easier to distinguish the different species of parasite than in thick films. The slides were marked by scratching with a needle on the film itself.

Leishman's stain was used and, in order to economize stain and water, the portion of the film to be stained was marked out with a grease pencil, so as to avoid covering the whole slide.

In all doubtful cases three separate blood examinations were made, after an appropriate interval of time between each.

Relapsing Fever. The spirochaetes are usually present in the early stages of the fever and are well shown in the ordinary films stained with Leishman. Occasionally, thick films were examined, dehaemoglobinized and stained with carbolfuchsin.

Bacillary Dysentery. If the exudate from the rectum contains numerous polymorphonuclear cells together with the refractile endothelial macrophages and *Entamoeba histolytica* is absent, the diagnosis of " probable bacillary dysentery " is justifiable. The method of cytological diagnosis employed and recommended is that described by WILLMORE and SHEARMAN (See this *Bulletin,* Vol. 12, p. 311).

Amoebic Dysentery. It is essential to examine a fairly fresh specimen as the entamoebae die out within a few hours. The discovery and recognition of *E. histolytica* is not always an easy matter, but the almost complete absence of polymorphonuclear cells combined with the presence of fragmentary remains of endothelial and other cells point to an amoebic infection.

Schistosomiasis. The diagnosis of both types is readily made by simple microscopic examination under a low power, when the characteristic ova either in the urine or faeces can be easily recognized.

Enteric Fever and Typhus Fever. The bacteriological diagnosis of these fevers cannot be undertaken by any forward diagnosis unit.

Cholera. The importance of an early recognition of this disease is such that all diagnosis units should undertake the work. DAVIES' method was employed (*Jl. Roy. Army Med. Corps.* 1920. Vol. 35. p. 329), which consists in agglutinating the bacillus, in primary culture in alkaline peptone water, with specific anticholera serum, upon a Garrow's agglutinometer. With this method the cholera vibrio could be recognized in 24 to 36 hours.

Diphtheria. Although very important, it is doubtful whether this can be undertaken by a forward diagnosis unit. It was found difficult to prepare good Loeffler's serum in the field; camel's serum was found to be satisfactory, but difficult to obtain. The preparation of this medium should be the duty of a base laboratory which can supply the field laboratories, and the latter can then perform the diagnosis.

E. H.

MADRAS. **Report on the Working of the King Institute of Preventive Medicine, Guindy, for the Year 1922-23.** (With Appendices) [CUNNINGHAM (J.). Director.]—pp. 58+2. With 4 charts. 1924. Madras; Supt. Govt. Press. [Price 1 rupee 12 annas.]

The first part of this valuable report is concerned mainly with matter of local interest, in the course of which the Director advocates the formation of permanent " investigation units " which should be attached to the Central Institute and be available at short notice for the investigation of any outbreaks of disease throughout the Presidency. Four units are proposed, one each for bacteriology, protozoology and malaria, entomology, and helminthology, respectively. Each unit must posesss extreme mobility and should be able to move off from the Institute with all necessary apparatus and stores within 24 hours of receipt of orders. Any media, stains, etc., can be prepared at the Central Institute and supplied to the units as required. Six of these units were sent out from the King Institute during the year under report, and the results were so satisfactory that the general adoption of this organization is strongly recommended.

Vaccine. 2,079,915 cases of vaccine lymph were issued during the year, of which returns for 61·1 per cent were received. "The results obtained with glycerine lymph are without exception superior to those obtained with lanoline lymph." The two kinds were tested by vaccinating 8,172 children, the majority being vaccinated with lanoline lymph on the right arm and glycerine lymph on the left. The results are given in tabular form :—

	Case percentage success.	Insertion, percentage success.
Glycerine lymph ...	90·9	84·5
Lanoline lymph	68·5	53·3

Attempts were made to purify glycerinated lymph with chloroform, but the results at present are inconclusive.

Examination of specimens. A special feature of this year has been the large number of specimens received for the diagnosis of relapsing fever, owing to the occurrence of a widespread epidemic throughout the Madras Presidency.

Research Work. Experiments with "Stabilised Bleach"* gave very satisfactory results, as this preparation retains its percentage of available chlorine over long periods of time ; no appreciable difference was observed after 5 months' storage. When stored in glass containers, the results were better than when the bleach was put up in zinc tins.

Numerous experiments on the rapid filtration of water through sand filters, carried out at Guindy during the years 1921–23, are reported in an Appendix. The results indicate that continuous and rapid filtration, through sand filters, at the rate of 8 inches or at the most 12 inches vertical per hour is the best and most economical way of using such filters as a preliminary to chlorination.

Appendix No. 2 contains a report [by J. H. THEODORE, I.M.D.] on the working of a camp laboratory at Alipuram Jail, Bellary, where bowel complaints, especially dysentery, had shown a tendency to increase. When the laboratory was installed there were 385 cases in hospital out of 4,400 prisoners. The stools of the entire jail population were examined during 12 days in order to detect any one suffering from latent dysentery ; all such cases were isolated and formed into a so-called "bowel gang." The result was a marked reduction in the total number of cases of dysentery in the jail, and also those that did occur were almost exclusively derived from amongst the members of the bowel gang.

An examination of 600 stools, taken at random, showed that 93·5 per cent. were infected with Ancylostoma, so the entire jail was treated, with very beneficial results as regards the general improvement in health of the convicts.

Appendix No. 3 [by Civil Assistant Surgeon RAMAKRISHNAN] comprises a report on relapsing fever in the Tanjore District, where an epidemic appeared in September 1921, and was very severe in January, February and March 1922. The epidemic was entirely restricted to the lowest classes of the community, among whom *Pediculus capitis* was present in almost every case, though *P. corporis* was not found. The mortality of the epidemic varied from 15·09 to 95 per cent., and out of 2,716 cases there were 1,415 deaths. The records of the number attacked, however, were not accurate.

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* Prepared by the United Alkali Co., Ltd., England.

As regards the clinical features, the majority of the cases showed one relapse, a few did not show any relapse, and a second relapse was never observed. The spirochaetes as a rule seem to appear in the blood on the second day of the onset of febrile symptoms and are found in fairly large numbers during the third, fourth and fifth days of the fever, after which they begin to disappear from the circulation. Mice and a monkey were infected by subcutaneous inoculation of infected blood.

Attempts were made to infect monkeys by means of head lice removed from patients suffering from the disease, but no positive results were obtained.

E. H.

CEYLON. **Administration Report for 1922. Report of the Director, Government Pasteur and Bacteriological Institutes for the Year 1922.** [NICHOLLS (Lucius), Director.]—18 pp. [Received from the Colonial Office.]

Rabies. Up to the end of 1922, 1,441 persons had been treated and there had been 15 failures, a percentage of 1·04. Attention is called to the existence of patients suffering from "hysteria rabietica," whose symptoms often closely resemble those of rabies, especially if they have seen another person suffering from this disease. Such cases of hysteria are very difficult to diagnose, but when the patient has not seen another person with rabies his symptoms are bizarre, such as barking like a dog and trying to bite other people. The condition is easily cured by suggestion and is no doubt responsible for the belief that rabies is susceptible to faith healing.

Vaccines. Dried vaccines, prepared in various ways, have given excellent results in the treatment of many chronic infections, and the dosage is more accurate than by counting and estimating the number in a suspension. Experiments are described showing that bacterial antigens are able to withstand desiccation, boiling, the action of absolute alcohol, formaldehyde and ether without losing their properties of giving rise to immune bodies on injection into men or animals. Absolute alcohol has a detoxicating effect and enhances the antigenic value of bacterial proteins. Ether removes lipoids and waxes and allows the alcohol to act freely on the proteins. A comparison was made between Haffkine's plague vaccine and one prepared by precipitation with alcohol and formalin, desiccation and boiling. The latter was found to be more effective.

The author has used this method of preparing vaccines with a number of organisms and finds that the following doses are well borne and do not cause a severe reaction :—

"Staphylococcus aureus	1 cc. of	in 750
Streptococcus haemolyticus	½ cc. of	in 500
Streptococcus viridans	1 cc. of	in 250
Bacillus pestis ..	½ cc. of	in 100
Bacillus dysenteriae ..	1 cc. of	in 750
Bacillus typhosus ..	1 cc. of	in 500
Ducrey's bacillus ..	1 cc. of	in 500"

E. H.

KENYA. Colony and Protectorate of. **Annual Report of the Bacteriological Laboratory for the Year 1922.** Vol. XIII. [KAUNTZE (W. H.), Senior Bacteriologist.]—pp. 133–201. With 2 charts. [No place or date of publication.] Printed by Waterlow & Sons, Ltd., London.

The first part of the report is concerned with laboratory policy, and a section on vaccine lymph production. One case of generalized vaccinia is recorded which developed in an Indian child the fourteenth day after vaccination, an unusually long incubation period. Glycerinated lymph was found to be more satisfactory than lanolinated lymph ; a comparison between the results of using the same strain of vaccine prepared in these two ways showed a higher percentage of success for primary vaccinations in the case of the former.

In the section dealing with routine examinations mention is made, respecting the differential leucocyte count, of the variation in results caused by differences in the method of counting. Finally NAPIER's method was adopted (see this *Bulletin*, Vol. 20, p. 425), namely, to count the whole length of the film about the centre line including both extremities. The marked variation in films taken from the same person at different intervals or even from different parts of the body [as noted by STEPHENS and others (see this *Bulletin*, Vol. 18, p. 280)] throws doubt on many of the conclusions, and it is remarked that the results accomplished with blood counts bore little relation to the labour expended.

The figures for malaria show a slight increase on those for the last year [which was exceptionally dry], and attention is called to the necessity of an entomological survey and an investigation of the types of mosquito carrying malaria.

Typhoid fever seems to be endemic. The cases occur at irregular intervals and in such sparse numbers that it is almost impossible to trace the source of infection. The diagnosis by agglutination tests is troublesome owing to the late stage at which agglutinins appear in the blood. The value of blood culture is shown by the fact that three out of the four cases in January gave positive results by this method.

A number of cases of amoebic dysentery were observed during the year, and " these patients all responded miraculously to a course of injections of emetine." Towards the end of the year an epidemic of bacillary dysentery broke out in the Native Hospital, Nairobi. An organism resembling *B. dysenteriae* (Shiga) was isolated, and by the issue of a polyvalent vaccine the disease was brought under control.

For the first time in the history of the country, the presence of undulant fever has been discovered, five cases having been observed during the year and diagnosed by the agglutination reaction.

The difficulty of obtaining a paraffin suitable for embedding, which will give good results under all climatic conditions, will be appreciated by all workers in the tropics. By mixing one part by weight of beeswax with five parts by weight of a mixture of hard and soft paraffin melting at 50°C., fusing them together and filtering, a medium is obtained with a melting point of 51°C.–53°C., which remains firm and tough at all temperatures.

Schistosomiasis occurs in many parts of the Colony, and in Nairobi usually affects the rectum. Planorbis containing fork-tailed cercariae were found in a canal close to the town, and in one case these were morphologically identical with those of *S. mansoni*, but an infection experiment with a guineapig gave negative results.

With regard to helminth infections, 605 stools were examined this year and the following results obtained :—

"Ova of Ancylostomidae were found in ..	70 cases	11·6 per cent.
Ova of Taenia saginata were found in ..	59 cases	9·8 per cent.
Ova of Trichiuris trichiura were found in ..	45 cases	7·4 per cent.
Ova of Ascaris lumbricoides were found in ..	33 cases	5·5 per cent.
Ova of Schistosoma mansoni were found in ..	10 cases	1·7 per cent.
Larvae of Strongyloides stercoralis were found in	9 cases	1·5 per cent.
Ova of Hymenolepis (sp ?) were found in ..	1 case	0·2 per cent."

A case of infection with *Sparganum mansoni* occurred in the previous year (1921) ; it was found in an abscess on the thigh of a Masai.

For the treatment of yaws sodium-potassium-bismuth-tartrate is now being employed instead of neosalvarsan or one of its derivatives. The Director of Chemical Research (V. H. KIRKHAM), in an appendix, gives full particulars of the method of preparation of the compound, which has been modified and simplified, and gives a substance containing 54·5 per cent. bismuth.

A number of experiments were made on the use of rat-poisons and poison baits, in order to find out the best methods of poisoning the common plague rat of East Africa, *Rattus rattus kijabius.* A summary of the results are given below :—

" 1. Maize flour forms a more attractive basis for rat poison baits than either bajri or mtama.

" 2. The attractiveness of a bait made of maize flour is not increased by the addition of jaguree, ghee. cheese, water in which fish has been boiled, or a mixture of equal parts of ox bile and amber oil.

" 3. Barium carbonate (crude) will kill *Rattus rattus kijabius* in 1½ grain doses in thirty hours.

" 4. The minimum lethal dose for rats of 'Common Sense Rat Exterminator' is 3 grains.

" 5. Squill and ratinol are too distasteful to rats to be taken in lethal doses.

" 6. Maize-flour baits containing barium carbonate are only slightly less attractive to rats than plain maize flour, whereas those containing 'Common Sense Rat Exterminator' are very much more distasteful.

" 7. Ratinol is harmless to fowls in doses of 60 drops.

" 8. The minimum lethal dose of barium carbonate for dogs is probably 2 grains per pound of body weight, for cats between 1 and 2 grains per pound of body weight, and for full grown fowls of average weight about 8 grains."

Rat viruses. Dr. P. H. ROSS, the former Director of Laboratories, found that rat viruses imported from England apparently lost all virulence in transit. The Liverpool virus, both as a meat bait and as a liquid, and Danysz virus were tested, and found to be useless as pathogenic agents for rats, thus confirming Dr. Ross's statement. In view of these results it is suggested that it would be advisable to prohibit the import of rat viruses.

Experiments on the use of fumigation showed that sulphur dioxide is a much more efficient agent for killing both rats and fleas than formaldehyde.

The flea index for Nairobi rats was determined for the year, three rats being examined daily and a total of 3,105 fleas being obtained, giving an average of 2·7 fleas per rat. *Xenopsylla cheopis* numbered 1,862, *X. brasiliensis* 974, and other species 269. Charts are given illustrating the incidence of the fleas throughout the year compared with the mean monthly temperature and the rainfall, but no important deductions can be made, although the flea minima occurred in the wet months, April and November, and the flea maxima in January and June, which were dry.

E. H.

TANGANYIKA TERRITORY. **Report of the Dar-es-Salaam Laboratory, for the Year 1922.** [Butler (G. G.)]. pp. 179–203. With 3 charts. [Issued with the Annual Medical and Sanitary Report. Tanganyika Territory, 1922. Received from Crown Agents for the Colonies, June 10, 1924.]

The number of cases of malaria showed a considerable rise towards the end of the year, probably as a result of an influx of recruits to the K.A.R. The proportion of the various types of malaria among Europeans was as follows:—

Subtertian	85·5 per cent.
Benign Tertian	9 6 per cent.
Crescents	4·8 per cent.

and similar proportions occurred among the natives.

An interesting chart is given showing the malaria incidence throughout the year, compared with the humidity at 9 a.m. and the percentage distribution of adult Anophelines. The writer is of the opinion that the relative humidity at 8 p.m. would be of most value in this respect, for a European is usually attacked by mosquitoes between 6 p.m. and when he goes under a mosquito net. The curves show a distinct correlation between humidity at 9 a.m., the only figures available, and the malaria incidence.

Relapsing fever seems to be on the increase, a total of 31 cases compared with 10 in 1921.

An interesting herb was sent in from Morogoro, which possesses the power of stupefying and killing fish and is used as a fish-poison. Its active principle seems to be a saponin and not picrotoxin, which is the usual fish poison.

Dr. HOWARTH's interesting observations on the breeding of mosquitoes in coconut trees are reviewed elsewhere, and the importance of his statement that even the highest trees may serve as breeding places is obvious to all workers in districts where they occur.

The remainder of the report contains details of the treatment of leprosy by intravenous injections of chaulmoogra ethyl esters X and Y, the dosage employed going up to 2·5 cc. by this method and 4 cc. intramuscularly. The results are inconclusive, but the occurrence of yaws or syphilitic lesions in association with leprosy is so common amongst natives that before any other treatment is begun it is advisable to treat these affections, in order to eliminate confusing conditions.

E. H.

UGANDA PROTECTORATE. **Annual Report on the Bacteriological Department for the Year ended 31st December, 1923.** [DUKE (H. Lyndhurst), Bacteriologist.]—23 pp. With 1 map. 1924. Entebbe: Govt. Printer, Uganda.

The main interest of this report lies in Part III, which is concerned with trypanosomiasis investigations. The writer again calls attention to his observation that exposure of a strain of trypanosomes to prolonged direct transmission leads to its loss of the power of cyclical development in the fly; at the same time the virulence of the parasite is increased. The antelope strain in which these changes have been traced has now been subjected to direct transmission for a period of more than three years. It has now completely lost the power of development in Glossina and at the same time its virulence in monkeys and guinea-pigs has greatly increased. Moreover, a morphological change has taken place, for the typical posterior-nuclear forms, which were present in the strain when first obtained from the antelope, have now disappeared.

The reclamation of the shores and islands of Lake Victoria is in progress and the number of settlers on the Sesse Islands on 31st August 1923 was 6,401; on Buvuma Island on 30th December 1923 was 3,852; and in the reclaimed areas of the mainland riparian zone about 1,000. Up to the present no cases of sleeping sickness have been recorded from either the Sesse Islands or reclaimed mainland, but three cases, possibly contracted in the lake area, have been reported to the Laboratory. All these, however, had resided in, or near, Jinja and may have been infected in the adjacent inland areas around the Mpologoma River.

Part IV of the report contains details of the preparation of plague vaccine; the dose of which has been fixed at 3,000 millions.

With regard to the routine examinations performed in the laboratory it is noteworthy that 91·1 per cent. of the native stools examined contained Ancylostoma eggs, and 17·7 per cent. the eggs of *Schistosoma mansoni*. In addition to the usual helminth infections, *Dibothriocephalus latus* was found on three occasions.

The investigation into the prevalence of *B. abortus* is being continued and the suggestion is put forward that this organism and *B. melitensis* may be related in the same way as *T. brucei* and *T. gambiense*, the former being dependent on ruminants, the latter on man as host. It may be that strains of *B. abortus* adapted to goats are pathogenic to man, but not otherwise.

E. H.

NIGERIA. **Annual Report on the Medical Research Institute for the Year 1922.** [CONNAL (A.). Director, Med. Res. Inst.]—40 pp. 1923. Lagos: Govt. Printer.

Half this report is occupied by studies of Calabar swellings and blackwater fever, which will be noticed in their appropriate places. The investigation of a case of intestinal coccidiosis was reported in this *Bulletin*, Vol. 20, p. 447.

Under "Entomological" it is noted that a female *Stegomyia fasciata* can produce fertile eggs during a period of 31 days, at which point the mosquito was accidentally killed, after the last opportunity of fertilization by the male.

In 136 stools from Europeans, *E. histolytica* was found 24 times with or without erythrocytes, and 6 times in cyst form; in 22 native stools, *E. histolytica* occurred 4 times, a similar percentage, but whereas these contained 4 varieties of worm eggs, none were seen in the Europeans.

A list is given of tumours examined but it is not stated whether they were all of native origin.

Dr. W. A. YOUNG reports on the Branch Clinical Laboratory, Colonial Hospital, Lagos, opened in February 1922. He notes that no case of bacillary dysentery was observed (*cf.* this *Bulletin*, Vol. 20, p. 509), and that the incidence of malaria among European officers was high.

Of 258 European bloods examined (films taken from all hospital entrants), 183 showed subtertian parasites. He attributes the high figure to (1) lack of scientific quinine prophylaxis, *e.g.*, limitation to 5 grains daily in all circumstances ; (2) refusal of quinine ; (3) imperfect absorption owing to gastric conditions induced sometimes by alcohol—he prefers liquid quinine before breakfast ; (4) supposed detriment of quinine to the system, inducing a syndrome which in some cases at least is due to malarial infection rather than quinine.

In 779 stools examined 6 species of helminths were found, the commonest being *A. lumbricoides*, which " most certainly has a distinct detrimental effect on health." Of 216 European dysenteric stools, 64 were of typical amoebic dysentery, showing *E. histolytica*, 112 were negative, and 40 showed epithelial debris, blood and mucus ; the 40 are regarded also as amoebic, but the suggestion is made later that some such cases are malarial ; no dysenteric bacillus could be isolated. The tubercle bacillus was found in 34 natives. " Chronic tuberculosis as seen in the European hardly exists in the native as yet, the cases being clinically of an acute, often very acute, type and the sputum being crowded with T.B."

Of 108 autopsies 32 showed pneumonia and 21 generalized tuberculosis. In one case the condition seen was typical of yellow fever, but pus was found in a joint and pure cultures of staphylococcus were grown. Two livers showed nymphs of *Porocephalus armillatus*.

There follows a report on HARPER'S treatment at the leper asylum and on the yellow fever outbreak at Warri, October-November 1922, which, it appears, may have been Weil's disease.

A. G. B.

TUNIS. **Notice sur l'Institut Pasteur de Tunis.**—23 pp. With 1 plate. 1924. Mar. Tunis : Imprimerie J. Barlier & Cie., 4, rue Annibal.

The Pasteur Institute, Tunis, was founded in 1893 for the study of methods of improvement of " vinification," and in the following year there were added antirabic and vaccine sections and a laboratory of analyses. It was third in order of Pasteur Institutes, the second being that of Saigon. In 1903 it was reorganized, when the present Director, Dr. Ch. NICOLLE, took charge, and from this period its chief activity dates. An interesting account is given of the discoveries made. Experimental work on typhus had its origin here. In 1909 the disease was reproduced for the first time in animals and the louse was proved to be the transmitter. With this knowledge typhus was banished in 2 years from the town of Tunis where it had raged time out of mind, and the results in the world at large are well known. Here, too, the part played by the same insect in relapsing fever was revealed (1911), and it was shown that soiled fingers, scratching, rubbing of the eyes, and not the bite, were the means whereby infection is conveyed. There follows an account of work done on kala azar and oriental sore, trachoma, the experimental study of which was initiated here, undulant fever, and many parasitic infections. In the antirabic service 12,124 persons have been treated, with 28 deaths, or 0·24 per cent. Data are given of publications, teaching, scientific missions, personnel, the part played by the Institute in the war, and so forth.

The income amounts to 316,000 francs, more than half of which is due to the sale of its products, and we are told that though legacies and gifts are invited for the maintenance of this beneficent institution, these do not exceed in 30 years the sum of 3,000 francs. The Institute is about to be rebuilt.

A. G. B.

FEDERATED MALAY STATES. **Annual Report of the Institute for Medical Research for the Year 1922.** [STANTON (A. T.). Director of Government Laboratories, F.M.S.].—pp. 28–36. *Supplement to the F.M.S. Government Gazette.* 1923. July 27. Kuala Lumpur: Govt. Press.

Malaria.—FLETCHER has investigated the action of quinine and other alkaloids of cinchona on malaria. Forty-two cases were treated with cinchona febrifuge (Bandoengsche Kininefabriek, Java) as effectively as with quinine sulphate; ten grains were given twice daily. In the same dosage the four crystallizable alkaloids, quinine, quinidine, cinchonine and cinchonidine "appeared to be of about equal value in causing the disappearance of malaria parasites." Of tasteless preparations of quinine euquinine was effective, quinine tannate and quinine carbonate worthless. The results of the enquiry by FLETCHER and VISUVALINGAM into the intramuscular method of giving quinine have been considered elsewhere (see this *Bulletin*, Vol. 20, p. 970). They conclude that quinine should only be administered by this route for urgent reasons and the doctor should not delegate the duty to others.

More work has been done on melioidosis, which will be reported in a separate memoir. A case of natural infection in a wild rat has been found. The conclusions were reached that *B. whitmori* is serologically identical with a strain of *B. mallei* from Muktesar but differs from it in its motility and in its growth on laboratory media; two other strains of *B. mallei* were more and less closely related to it; that *B. whitmori* is a member of the *B. mallei* group of organisms, and melioidosis a form of glanders which primarily affects rodents.

The table reproduced gives the results of the examination of 1,030 cases from the dysentery wards at Kuala Lumpur classed according to nationality. The higher degree of infection among the Indians may be correlated with their poorer mode of life as compared with the Chinese.

INCIDENCE OF INTESTINAL PROTOZOA IN RELATION TO NATIONALITY.

Organism.	674 Indians (mostly Tamils).		356 Chinese.		4 Malays.
	No.	Per cent.	No.	Per cent.	No.
Entamoeba histolytica	128	19·1	20	5·6	1
B. Coli	74	11·0	6	1·7	—
? Amoebae	21	3·1	5	1·4	—
Endolimax nana	19	2·8	4	1·1	—
Iodamoeba butschlii	4	—	0	—	—
Giardia intestinalis	34	5·0	9	2·5	—
Trichomonas hominis	111	16·5	8	2·2	—
Chilomastix mesnili	24	3·6	2	—	—
Enteromonas hominis	33	4·9	3	—	—
Embadomonas intestinalis	0	—	1	—	—

A. G. B.

MISCELLANEOUS.

LISTER (Spencer). **The Use of Pneumococcal Vaccine.** [Discussion.]—*Proc. Transvaal Mine Med. Officers' Assoc.* 1924. Feb. & Mar. Vol. 3. Nos. 10 & 11. pp. 1–10; 1–9. With 2 charts.

This is a discussion of Sir Spencer Lister's paper on pneumococcal vaccine reviewed in this *Bulletin, ante* p. 462. The usual *a priori* objections against the inferiority of mass statistics compared with laboratory experiments, and, on the other hand, against the applicability to man of inferences based on laboratory experiments on animals, may be passed over.

Dr. GOW produced some interesting statistics from the Premier mine for the years 1908–1923, which are reproduced below. These show that in the first twelve months (1917) after the entire strength (5,751 individuals) had been inoculated 3 times with a 4,000 million dose of Lister's 3-strain pneumococcal vaccine the incidence-rate of pneumonia, which in previous years had ranged between 20·3 and 152 per thousand, fell to 4·5 per thousand of annual strength, and the death rate, which in previous years had ranged between 3·3 and 31·1 per thousand, fell to ·87 per thousand of annual strength. They further show that in the 5 years after 1918, when the 8-strain vaccine was introduced, the annual incidence rates of pneumonia per thousand were respectively 0·8, 0·6, 0·5, 0, and 1·8, and the corresponding death-rates were 0·2, 0·42, 0·5, 0, and ·92.

Dr. DONALDSON stated that the pneumonia death-rates for the years 1921–23 on the Crown mines [under pneumococcal vaccine] averaged 2·1 per thousand. He suggested that the fall in the death-rate at the Premier mine might be due to a considerable extent to the dismissal of tropical labour. Dr. IRVINE also thought that tropical natives were a "forcing-house" for pneumonia and that their removal was an important factor in the reduction of that disease.

Dr. ORENSTEIN quoted statistics from the Central Mining group that showed fluctuations of annual pneumonia-mortality between 12 and 4 per thousand in a force of 52 to 62 thousand natives when practically no vaccination was being done. He also made comparisons of groups of mines where vaccination was carried out with groups where vaccination was not practised, showing a higher mortality-rate from pneumonia in the former than in the latter. His final opinion was that the observed results of vaccination against pneumonia, as practised on the Central Mining group, had not unquestionably demonstrated its value.

Dr. BUTT had always been a supporter and Dr. FREW was a particularly enthusiastic adherent of pneumococcal vaccination. Dr. HERTSLET had had good results during 4 years, practising a single inoculation of 2 cc. (32 thousand millions). Dr. PRATT JOHNSON, who still criticized the mode of preparation of the vaccine, was at last satisfied that evidence was beginning to accumulate, of a kind that he considered satisfactory, in favour of pneumococcal vaccination.

Lister, in his replies to his various critics, allowed that removal of tropical natives had something to do with the reduction of death-rates from pneumonia. He stated that the figures of ORENSTEIN'S unfavourable comparisons were not correct, and insisted that the correct figures (which he quoted) show a much lower pneumonia death-rate from mines where vaccination was practised than from mines where it was not.

The final outcome of the long discussion was a decision to recommend, optionally, instead of the present method of inoculation, two inoculations at an interval of between 6 and 12 days, the first dose to be equal to 8,000 millions, the second to 16 thousand millions.

PREMIER (TRANSVAAL) DIAMOND MINING COMPANY, LIMITED.

PNEUMONIA STATISTICS—1908–1923.

Year.	Compound Strength.	Cases of Pneumonia.	Case Incidence per 1,000 Compound Strength per Annum.	Deaths from Pneumonia.	Death Rate per 1,000 Compound Strength per Annum.
1908	7,935	*a* 483	73·1	*a* 93	15·6
1909	7,429	653	87·8	110	14·8
1910	11,348	1,637	144·3	315	27·8
1911	10,569	1,607	152·0	329	31·1
1912	13,368	882	66·0	255	19·1
1913	14,556	642	44·1	111	7·6
1914	13·085	*b* 199	20·3	*b* 32	3·3
1915	—	*c* —	—	*c* —	—
1916	2,464	*d* 186	100·7	*d* 21	11·4
1917	5,751	26	4·5	5	·87
1918	4,912	*e* 65	13·2	*e* 20	4·1
1919	5,063	4	·8	1	·2
1920	4·794	3	·6	2	·42
1921	2,018	1	·5	1	·5
1922	1,243	—	·0	—	·0
1923	2,162	4	1·8	2	·92

a. Figures for ten months.
b. Figures for nine months.
c. Mine closed August, 1914 ; re-opened January, 1916.
d. Figures for nine months.
e. 29 cases of Pneumonia. 15 deaths during epidemic of Influenza.

A. Alcock.

GAUTIER (M. A.). **Rapport de la commission des épidémies en Grèce.**— *Grèce Méd.* 1924. Jan.-Feb. Vol. 26. Nos. 1-2. pp. 1–26.

The Commission, instituted by the League of Nations, was constituted in November 1922, after the disasters to the Greeks in Asia Minor, as a precaution against the spread of disease by the refugees, of whom great numbers, mostly old people and women and children in uttermost misery, reached Greece. It was placed under a special Greek Minister, who at once conferred autonomy on the vaccination department, of which the author was General Secretary with a staff of 11 doctors and 59 students and vaccinators, subsequently increased by 20 to 35 vaccinators from the 2nd army corps. The personnel was concentrated at Athens, the Piraeus, and Salonica, detachments being sent occasionally to localities where epidemics were reported.

Vaccination against smallpox, cholera, and enteric was carried out generally, but against plague and dysentery only where epidemics actually supervened. Refugees objected to vaccination, particularly against enteric.

Observations on anti-typhoid vaccinations.—Vaccine in which the bacilli had been killed by addition of carbolic acid caused no after-trouble, whereas that in which they had been killed by heat (58° C.) caused considerable local reaction and fever. Several hundred thousand refugees were subcutaneously vaccinated, and although epidemics of typhoid occurred among the neighbouring inhabitants in Athens and in the islands of Hydra and Spezzia, there were very few cases in the refugee camps and those for the most part among unvaccinated individuals.

Vaccination against smallpox.—When the Commission started work a considerable epidemic of smallpox was raging in refugee camps at the Piraeus and Athens and also among the resident population, vaccination having been very much neglected in Greece. Serious epidemics afterwards occurred at various places in the provinces, particularly in Epirus. More than 1¼ million vaccinations were done.

Vaccination against plague.—A small epidemic of bubonic plague occurred in the island of Syra and another at the Piraeus. More than 93,000 vaccinations are recorded in the statistical table, but the value of the vaccine prepared in Athens was doubtful.

Vaccination against dysentery.—Subcutaneous vaccination was not much employed and always occasioned a painful abscess; but about 30,000 buccal vaccinations were given, mostly with a liquid polyvalent vaccine (Shiga, Flexner, Strong, and Y) containing about 3½ thousand million bacilli per cc. This vaccine caused a little dizziness and nausea and sometimes a transient diarrhoea. The vaccinations were given in places where dysentery was endemic or epidemic, but no vaccinated person contracted the malady, and on one occasion when a severe epidemic (Flexner) broke out in a camp it ceased at once among the vaccinated though continuing among the unvaccinated. In short, the efficacy of the buccal vaccination was demonstrated to the author's satisfaction.

Buccal vaccination against typhoid.- In the month of May, 1,210 individuals at Athens and Salonica received Besredka bilivaccin *per os*; in the following summer and autumn (July-October) many cases of typhoid occurred in both those places, and numerous deaths, but not a single case among those who had been vaccinated in May. Again, at the village of Kakossalessi, in Attica, with a resident population of 1,400 and 40 families of summer visitors, and the one common supply of drinking water found to be badly contaminated with coli, numerous cases of typhoid occurred in July and the following months (probably about 200 cases up to September). In September 1,043 persons were vaccinated *per os*; 963 received a liquid vaccine made in Athens containing about 3 thousand million bacilli, 60 received Besredka bilivaccine, and 20 received Lumière entero-vaccine, the first two vaccines being given on an empty stomach on 3 successive days, the last on 7 successive days. The vaccinators stayed in the village from the 11th to the 22nd September, during which time 10 new cases occurred, only one of which was a vaccinated individual—who had been vaccinated only 7 days before his attack.

Vaccination against typhus.—During an epidemic 51 vaccinators and 37 doctors and hospital assistants consented to be inoculated, each with 1 cc. of serum obtained from the blood of patients in the acute stage of the disease. There was no reaction, and among the 88 persons so vaccinated only 2 were subsequently attacked, one of them with a fatal result, although all were constantly exposed to infection. It must be noted, however, that 13 vaccinators equally exposed but not vaccinated were not attacked.

Notwithstanding all the charitable assistance freely given and the specific protection afforded against formidable contagious diseases, and notwithstanding the incomparable mildness of the climate of

Greece, yet at the camps at Athens and the Piraeus, where about 117,588 people were accommodated, the number of deaths recorded during 13 months was 4,120, of which nearly one-fourth were infants and young children under 3 years, and nearly one-fourth adults over 50 years. At Salonica, where the number assembled was at first 100,000 but was gradually diminished as the refugees were drafted off to agricultural labour, so that the mean average population is given as 35,000, the number of deaths in 13 months was 4,095, of which 847 were children under 2 years, and 974 old people over 60 years. At Athens and the Piraeus the diseases chiefly responsible for the mortality were, in that order, dysentery and enteritis (889), respiratory (576), tuberculosis (432), smallpox (346), typhus (298) ; at Salonica they were, in that order, dysentery and enteritis (998), respiratory (648), malaria (573), tuberculosis (527).

A. Alcock.

SEYFARTH (C.). **Seuchen und Seuchenbekämpfung in Russland.**—*Ztschr. f. Klin. Med.* 1924. Vol. 100. No. 1/4. pp. 203-222. With 4 figs. [17 refs.]

This is the report of a Medical Relief Expedition to the famine districts of Russia, and the following is a summary of its calamitous items :—

Typhus.—Between 1918 and 1922 about ten million cases were officially recorded in the Soviet republics ; probably, however, the actuality for the whole of Russia was from thirty to thirty-five million cases, with a mortality varying from 7 to 10 per cent. Novarsural and other preparations of mercury, by intravenous injection, sometimes had a marvellous effect when given as soon as the diagnosis was established—subject, of course, to the usual contra-indications for mercury.

Relapsing-fever.—This followed typhus, and though the official estimate for the whole of Russia, between 1918 and 1922, was only three million cases, the real number was probably between fifteen and twenty million. Bugs as well as lice were said to carry the infection. The mortality was heavy ; in Petrograd it was known to be 8·1 per cent. in 1918 and 4·9 per cent. in 1919. Neosalvarsan generally had a good effect ; in cases where treatment had been delayed it generally suppressed the relapse when given on the 4th or 5th day of the apyretic interval.

Mixed infection of Relapsing-fever and Paratyphoid.—It is not only to the want of drugs for treatment that the author ascribes a peculiar complication, or mixed infection, of these two diseases, particularly prevalent in 1920–21. These mixed cases ran a terribly severe course and the mortality was over 50 per cent. The principal symptoms were jaundice and diarrhoea. Post mortem the kidneys were found infiltrated with small yellow enteric-like lymphomata and the glomeruli showed a haemorrhagic inflammation ; the spleen was enlarged and studded with infarcts often in a state of suppuration, the whole organ in some cases being destroyed ; the liver was generally enlarged ; the condition of the intestine ranged from acute haemorrhagic catarrh to severe croupous ulceration ; and evidence of pyaemia might be found in heart-muscle, endocardium, meninges, and other organs. The bacillus responsible showed a serological behaviour between paratyphoid A and B. Most Russian observers considered the disease not to be bilious typhoid. The question of complication with Weil's disease was raised but not answered.

Simple enteric.—Paratyphoid B, independent of relapsing-fever, was also observed, particularly in Petrograd; but owing to the prevalence of typhoid in Petrograd before the war (1912–1914) it is probable that the population had become considerably immunized.

Cholera appeared in the spring of 1918, beginning in Astrakhan and spreading westwards, and also independently in Petrograd. Infection was spread mostly by railroad, and not by waterways. In a severe epidemic in the Ukraine, in 1921, 183,000 cases were recorded.

Dysentery was of comparatively small importance and confined to the large towns, particularly Petrograd; only a few scattered cases were amoebic.

Smallpox occurred chiefly in the northern provinces. In the state of Petrograd, in 1919 (the worst year), there were 5,658 cases. In 1920 vaccination was carried out in the Red army and as much as possible among the civilian population.

Bubonic plague.—Small active foci existed in the Far East, in south-east Russia, and along the borders of the Black Sea.

Malaria.—This, in all its forms, has become the widest-spread, severest, and most persistent disease in Russia; it is quite impossible to state the weight and incidence of the infection.

A. A.

ANNALES DE MÉDECINE ET DE PHARMACIE COLONIALES. Paris. 1923. Sept.-Oct.-Nov.-Dec. Vol. 21. [23 *sic.*] No. 3. pp. 345–355. [1 ref.]—**Le service médical dans les postes consulaires de Chine de 1921.**

The consular posts of this report are Yunnanfou, Mongtseu, Hoihow, and Canton, and the reports refer to 1921.

The number of patients treated in hospital at Yunnanfou was 542, of outpatients 55,543, of surgical operations 148. The number of vaccinations was 3,308, of which 2,883 were successful. During recent years diphtheria and scarlatina have been epidemic here, and are said between them to have smitten 95,000 persons and carried off 30,000, in a population of 250,000. The scarlatina was of a peculiarly virulent type, perhaps because it is here a new disease; it is known to have annihilated families of 7 to 11 children in a few days. Opium-smoking goes on, although strictly forbidden, and alcoholism increases although the price of liquor is about double what it used to be.

At Mongtseu 791 in-patients and 64,688 out-patients were treated, and the number of surgical operations was 567, of which 439 were eye cases. All these figures are said to be below the average on account of fractious native officialism. The number of vaccinations and re-vaccinations was 2,760, of which 915 were successful. The poppy is cultivated on a large scale and opium-smoking flourishes exceedingly. In the treatment of purulent conjunctivitis an eye-wash of 1 per cent. $KMnO_4$ was most efficacious.

At Hoihow 606 in-patients were treated, of which 170 were females and 66 accouchements, and 6,700 out-patients, and the number of surgical operations was 9. The number of vaccinations and revaccinations was 1,238; of primary vaccinations 81 per cent. were successful.

At Canton the number of in-patients treated was 1,426, of out-patients 6,112, of surgical operations 313. At the school of medicine here there were 60 students, of whom 13 were female.

A. A.

LEAGUE OF RED CROSS SOCIETIES. **First Conference of Oriental Red Cross Societies, Bangkok, November 29th-December 7th 1922. Proceedings.**—189 pp.

This Conference of Oriental Red Cross Societies held at Bangkok was attended by delegates from America (Philippines and China), Australia, Britain, China, France (Indo-China), India, Japan, Netherlands (East Indies), Siam, and Geneva, as well as by representatives of the League of Nations, Rockefeller International Health Board, British Colonial Office, and Council on Public Health Education in China. It passed resolutions declaring its conviction that the programme of the Federated Red Cross Societies formulated in Geneva in March 1922 is entirely feasible in the Oriental field, and it urged the Societies represented at the Conference to embark at once upon one or more of the three main activities of popular health instruction, public health, and nursing and Junior Red Cross, and also to form consultative National Health Councils to co-operate with other public health agencies. The Conference also decided to urge National Societies working in territories where the abuse of opium is prevalent to make instruction regarding the danger of such abuse one of their chief educational objects. The success of the Conference is taken as a happy augury and authentication for a scheme of similar regional conferences to include the whole world in its sweep.

A. A.

DELAMARE (G.). **Le fonctionnement de la Chaire de Médecine Exotique en 1923. [Faculté de Médecine de Constantinople.]**—16 pp. With 6 figs. 1924. Constantinople : Imp. Ahmed Ihsan & Cie.

This account of the various activities associated with the seemingly temporary chair of exotic medicine attached to the Haidar Pasha Hospital at Constantinople appears to be of a justificatory-frustrate-valedictory kind. At any rate the occupant of the chair seems to have carried on with limited resources some very useful work of a missionary nature in tropical medicine. In addition to lectures and demonstrations on the pathology, bacteriology, and clinical aspects of certain tropical diseases, abstracts of important memoirs were made and were published in the (apparently now defunct) *Bulletin Sanitaire de Constantinople.* Some original papers also were published, some of which have been noticed in this *Bulletin.*

A. A.

RIBOLLA (Romolo). **Contributo allo studio su alcuni fenomeni neuropsichici nelle popolazioni tropicali.**—*Arch. Ital. Sci. Med. Colon.* Tripoli. 1923. Oct.-Nov.-Dec. Vol. 4. No. 10–11–12. pp. 239–248.

The author, in discussing the question of Latah, draws analogies and traces connexions between it and the old religious dances, fanaticism, revival enthusiasm, and hypnotism, and regards the condition as being due to "an incompleteness of psychical personality, with ready suggestibility, which diminishes the normal inhibitory powers and leads to the development of psychic automatism" in the more ignorant and impressionable Eastern races. [This seems to be rather a definition of the disease than an explanation of its aetiology.]

H. Harold Scott.

TAMALET (E. J. M. G.). **Les suites éloignées des affections des pays chauds et leur thérapeutique hydrominérale.**—*Arch. Méd. et Pharm. Milit.* 1924. Feb. Vol. 80. No. 2. pp. 95–122. [51 refs.]

This long paper is concerned entirely with Vichy. The author, a military surgeon, is stationed at the Military Hospital there, which contains 174 rooms for officers and 118 beds for N.C.O.'s and privates, and was founded in 1847 for the benefit of soldiers, especially those returning from Africa and the Colonies. The mode of action of the water is discussed and the treatment of various tropical diseases. It is noted that the type of malaria seen is quite different from the type of thirty years ago, when the majority of the deaths at the hospital were the result of malarial cachexia: these cases are now not seen. It is stated that the cure has a surprising effect on the visceral sequelæ of malaria, and especially the hepatic lesions, but no specific effect on the parasite. The action on the general nutrition, digestion, liver, spleen and kidneys in this affection is discussed at length. The author recognizes an association between malaria on the one hand and diabetes and biliary calculus on the other. Next is discussed the "colonial liver," which is compounded of malaria, blackwater, amoebiasis, syphilis, alcoholism and alimentary intoxication, but emetine treatment does not receive mention. Of amoebiasis patients those with the intestinal infection are not benefited, but the hepatic cases improve; here again it does not appear that emetine is employed. The conduct of the cure is next discussed and lastly the reactions and contra-indications.

A. G. B.

FUSCO (Gennaro). **Tentativi di chemioterapia per via cutanea nella tripanosomiasi sperimentale, nella febbre ricorrente e nella siflide** [Cutaneous Chemotherapy in Experimental Trypanosomiasis, in Relapsing Fever and in Syphilis.]—*Riforma Med.* 1924. Jan. 14. Vol. 40. No. 2. pp. 29–30.

The author states: "A single drop of a 1 in 10 solution of the trichloride of arsenic applied to the intact skin arrests the disease [*T. brucei* infection in guineapigs] with certainty, and the trypanosomes, even if in large numbers, disappear from the circulation in 24 hours." He also states that in 1919 application of arsenic trichloride in cases of relapsing fever among Austrian prisoners of war brought about rapid and decisive effects in the primary fever and in relapses. On secondary syphilitic manifestations similar results were obtained and mucous plaques rapidly disappeared.

H. Harold Scott.

HEYDON (G. M.) & MURPHY (T. W.). **The "Biochemical Index" in Natives of the Territory of New Guinea.**—*Med. Jl. Australia* 1924. Apr. 19. Year 11. Vol. 1. No. 16. (Supplement.) pp. 235–236. [6 refs.]

This paper records the results of blood-group investigation (by the method of Moss) of 753 Melanesians, all male and mostly adult, from the Territory of New Guinea, including the main island, the Solomon and Admiralty Is. and New Ireland. The following are the figures obtained :—

Agglutinogens present: von Dungern & Hirschfeld's nomenclature.	Jansky's Classification.	Number of individuals.	Percentage.
O	Group I	404	53·7
A	„ II	202	26·8
B	„ III	123	16·3
AB	„ IV	24	3 2

The " biochemical index " (ratio of A's to B's ; *i.e.* sum of Groups II & IV÷sum of Groups III & IV) is 1·54.

The Hirschfelds (*Lancet* 1919, p. 675) classified the races they examined in 3 groups—a European type, index 2·5 to 4·5 ; an Intermediate type, index 1·3 to 1·8, which included Arabs, Turks, Russians and Jews (and also includes the S. African Bantu) ; and an Asio-African type, index 0·5 to 1·09, which included Malagasy, Senegalese, Annamese, and Indians (and also includes Filipinos and Chinese). In this classification these Melanesians would come in the intermediate type and would also approach the Malagasy (index 1·09) in the Asio-African type.

The authors draw attention to the interesting fact that the Australian aborigines, who differ greatly from Melanesians in anthropological characters, have a high biochemical index near the extreme " European " end of the scale.

A. A.

D'ANFREVILLE DE LA SALLE (L.). **La question des mulatres.**—*Presse Méd.* 1924. Feb. 27. Vol. 32. No. 17. (Supplément.) pp. 338–340.

The author, who lived for ten consecutive years in Senegal, describes the origin of the mulatto community there, about the end of the 18th century, from the union, under Nature's sanction, of European sojourners with native women. Later arrivals from Europe made temporary matrimonial contracts with mulatto women of the earlier generations, and in the latter half of the 19th century lawful marriage between Europeans and mulatto women became not infrequent. At that time the mulattos performed many useful functions in commerce and in the political administration, often occupied good and even honourable positions, and had a fair chance of becoming a class of some permanent consequence locally. But with the introduction of universal franchise (in 1881) the mulattos lost their headway ; in the author's opinion they had not grit enough to hold it, and now they seem to be, as a class, of little consequence. The author makes a statement which, if it can be confirmed, indicates that the progeny of mulatto with native African exhibits the operation of Mendelian segregation : he states that the oldest mulatto family of Senegal is represented at present by several branches, one of which is " almost absolutely white " while the others are light coffee-colour or " almost pure black." The author lays stress on the fact that there are among mulattos many men of individual worth, and that he is writing of the mulattos merely as a people of mixed white and black race born and bred in tropical Africa.

A. A.

FARAKER (Erskine). **Notes on a Year's Work (1923) at the U.F.C. Mission Hospital, Kalna, Burdwan District.**—*Indian Med. Gaz.* 1924. Apr. Vol. 59. No. 4. pp. 191–192.

At this hospital 9,000 cases received treatment, 360 as in-patients. Ninety cases of kala azar were treated within and 200 outside the hospital. Diagnosis was made in practically every case from clinical symptoms plus the aldehyde test. This test, however, was strongly positive in a case of actinomycosis of the lower ribs, one of empyema of the lung, and several of alcoholic cirrhosis of the liver. An in-patient, on the other hand, with low fever, who reacted negatively, died a week later with leishmania in the spleen. For malaria cinchona febrifuge in 15 grain daily doses had been the mainstay. The routine treatment for helminths is Ol. chenopodium m. 15 with carbon tetrachloride m. 45 in capsule at night and mag. sulph. in the morning; it has been effective.

A. G. B.

STEUDEL (E.). **Aus den Jahres-Medizinal-Berichten 1912/13 der tropischen deutschen Schutzgebiete.**—*Beihefte z. Arch. f. Schiffs- u. Trop.-Hyg.* 1924. Vol. 28. No. 1. pp. 1–63.

The annual medical reports of the Tropical German Protectorates (East Africa, Cameroon, Togo, New Guinea, Samoa) were issued yearly in a bound volume up till 1910–11. At the outbreak of the War the 1912–13 reports were under revision. They are now issued in an abridged form, and can be consulted by the curious.

A. G. B.

BETTS (A. J. Vernon). **The Operation of Litholapaxy and its Limitations.**—*Indian Med. Gaz.* 1924. Apr. Vol. 59. No. 4. pp. 187–191.

An interesting and valuable paper by a surgeon with an extensive knowledge of the special subject dealt with. The author is of opinion that the technique and limitations of the operation of litholapaxy are not always sufficiently clearly understood, and that, in consequence, a cutting operation is sometimes resorted to when simple crushing, with its rapid convalescence, would be in every way preferable. He proceeds to indicate the type and make of lithotrite which in his practice has given the greatest satisfaction, and points out some common faults to be remembered and avoided in the selection and choice of this class of instrument. The evacuator preferred is one of the author's own design described in the *Indian Medical Gazette* of August 1911. It has the advantage of being extremely sensitive and is of simple construction.

When litholapaxy fails in cases of vesical calculus the author attributes the failure either to its performance in unsuitable cases or to the employment of unsuitable and bad lithotrites. He is insistent on the fact that the operation has its limitations. Simple litholapaxy is recommended in those cases only where the stone can be easily grasped. When the calculus is just too large or too hard to be readily grasped and crushed median perinaeal litholapaxy is held to be indicated, and in all other cases supra-pubic lithotomy. Encysted vesical stones—in the author's experience extremely rare and "far more often imaginary than real"—of course call for the supra-pubic operation, while stones encysted in the prostatic urethra are best dealt with by median perinaeal lithotomy.

Clear and detailed accounts of the operative procedure both in simple and perinaeal litholapaxy are given. Among the points emphasized are the necessity of a good skilled anaesthetist, who will maintain complete relaxation of the abdominal wall throughout the operation, and the desirability of avoiding over-instrumentation.

With the larger lithotrites, "provided they are fitted with a wheel and not a lever," the fullest force that can be exerted with one hand may, if required, be employed in crushing, but with the smaller instruments when the amount of force called for appears to trespass on the limits of safety litholapaxy should be abandoned in favour of the cutting operation.

The paper concludes with a table which gives a record of 66 consecutive operations for vesical calculus by the author in the year 1923 without a death. 58 were ordinary litholapaxies, 3 median perinaeal litholapaxies, and 5 supra-pubic lithotomies. The average stay in hospital was less than four days—only 2·4 days if we exclude the supra-pubic cases.

[Well deserving of perusal in the original by those interested. The author is to be congratulated upon results to the attainment of which practice, experience, patience and dexterity must all have contributed.]

J. J. Pratt.

McCarrison (Robert). **Effects of the Long-Continued Ingestion of Tyramine and Histamine.**—*Indian Jl. Med. Res.* 1924. Apr. Vol. 11. No. 4. pp. 1137–1156. With 3 plates & 4 charts. [1 ref.]

The subjects of experiment were pigeons and young rats. The following are the main results:—

Both amines retard and may even inhibit growth, tyramine more potently than histamine. Both cause a sharp fall in the respiratory rate during the first 35 days of ingestion by pigeons; thereafter the rate tends to rise again, especially with histamine, but not to the initial standard. Tyramine tends slightly to increase body temperature in birds, histamine to depress it after a slight increase during the first month. Tyramine may possibly—if rarely—cause exophthalmos. Both amines reduce the size of the thymus, and tend to reduce (without affecting the histology) that of the thyroid, but appear not to affect the parathyroid. Histamine has a pronounced effect on the adrenal medulla of pigeons, but apparently little effect on that of young rats, though it causes an increase in size of the young rats' adrenal glands; tyramine causes a less distinct enlargement of the adrenals in both pigeons and rats. Tyramine causes marked reduction in size of the spleen in pigeons and rats. Histamine causes marked reduction in weight of the heart in pigeons and rats. Both amines—especially histamine—tend to increase the weight of the lungs and to reduce the weight of the pancreas in young rats. Tyramine tends to increase the weight of the pancreas in pigeons. Both amines cause a reduction in weight of the kidneys in young rats. Both cause slight reduction in weight of the gastro-intestinal tract. Neither amine exercise any effect on the weight of the testicles. Neither exercise any effect on the weight of the liver in young rats, but in pigeons histamine appears to cause a reduction in weight of the liver. Adult animals appear to become in time habituated to the ingestion of these amines; in young animals, however, the effects on growth persist after ingestion is discontinued.

A. A.

DE ALMEIDA (A. Ozorio). **Le métabolisme basal de l'homme tropical.**—*Jl. Physiol. et de Path. Gén.* 1924. Jan. Year 23. Vol. 22. No. 1. pp. 12–18. [8 refs.]

The author re-affirms his contention that the basal metabolism of tropical man is much lower than that of people who live in temperate climates. It has been already noted in these columns that EIJKMAN maintains that no such difference exists. EIJKMAN'S results are now attributed to the fallacious method he employed, viz. :—the apparatus of Geppert and Zuntz. De Almeida states that analysis by the Geppert-Zuntz apparatus does not give the mean composition of expired air, but approaches near to that of alveolar air, and he indicates how the error should be corrected.

W. D. Halliburton.

EIJKMAN (C.). **Some Questions concerning the Influence of Tropical Climate on Man. An Advanced Lecture in Hygiene delivered under the Auspices of the University of London.**—*Lancet.* 1924. May 3. pp. 887–893.

This is (up to the present date) the last of the international exchanges of courtesy that have been in progress between the Universities of this country (especially of London) and those of Holland for some years, but it is by no means the least in importance. It is so full of interest that every word deserves careful reading, and a short notice, such as this must be, is quite inadequate. It is the widespread belief that tropical lands must of necessity be unhealthy, as is shown by the popular expression " the white man's grave." The gist of Professor Eijkman's lecture is that this is a fallacy. Not only are many of the tropical diseases capable of prevention or cure, but the increase of physiological knowledge should furnish colonists, if suitably chosen, with the means which they ought to take in adapting themselves to new conditions of life. No one denies or attempts to deny that the struggle for existence against the forces of nature is severer in hot climates, but the author shows in outline how acclimatization should be brought about. His first point treats of the so-called tropical anaemia, often incorrectly diagnosed by mere pallor of the countenance, and he italicizes his conclusion (after outlining the evidence) that *there exists no purely physiological anaemia of hot countries.* The question of basal metabolism is next dealt with, but in no polemical vein. There are differences in diet, but the total caloric value is about the same in the natives as in those who live in cooler zones; here the colonist might take a useful lesson from the inhabitants and lessen his protein intake. Among many other subjects the author shows that differences in sweating are not due to differences in the number of sweat glands. There is often a tendency for the European to do " everything as usual "; if he accommodates his practices to meet what is to him unusual there is no reason why he cannot fit himself to the climate, for the climate is an unalterable factor. Adaptation must consist in altering a number of one's habits, food, stimulants, clothing, exercise and so forth.

W. D. Halliburton.

SCHNEIDER (J.). **Effects of Altitude on Health and Longevity. (With Particular Reference to South Africa.)**—*Med. Jl. S. Africa.* 1924. Apr. & May. Vol. 19. Nos. 9 & 10. pp. 273–279; 321–332. With 1 map in text. [31 refs.]

This essay obtained the second place in a certain prize competition, and possesses high merit, showing evidence of industry and capacity of clear exposition. It is only of secondary importance to the student of tropical life, except that migration to higher or cooler grounds is particularly necessary to those who live near the coast in the tropics. The physiological means of adaptation to altitude (by change in blood and respiration) are well known and are admirably summarized. Naturally the reviewer cannot object to the physiological views which form so large a section of the essay, seeing they are taken mainly from his own text book with due acknowledgment. Similarly in its medical section the views are those of OSLER and other well-known writers who are quoted. Whenever the author ventures to interpolate remarks of his own in the account of his cases of heart disease and abnormal blood pressure, this is done with admirable modesty. There are a number of misprints which present no difficulty and are probably due to inexperience in reading proof-sheets, but one word puzzles. One reads " the condition of the blood pressure is most *innuent.*" Is the word in italics a new one?

W. D. Halliburton.

TANON & CAMBESSEDÈS. **A propos du traitement de la variole par le xylol.**—*Rev. Méd. et. Hyg. Trop.* 1924. Jan. Vol. 16. No. 1. pp. 15–18.

The authors write in praise of xylol for smallpox, which it appears was introduced in 1871, forgotten, and reintroduced in Russia in 1903, since which date it has been employed in Paris. It is given in wine, 60–120 drops daily, in 2 or 3 doses, till improvement or hyperpigmentation sets in. It should then be decreased by 20 drops till 10 is the daily total. For babies 10 drops is a sufficient dose; children take it in milk. The effect is threefold: the smell disappears, suppuration is checked, and cicatrization leaves little trace. The checking of suppuration saves many lives and the mortality is said to fall by more than half. The chief inconvenience is hyperpigmentation, which gradually disappears and would not be noticed in coloured people. The authors have treated several hundreds of cases and have no doubt of the great advantages of the use of xylol in smallpox.

A. G. B.

VAN HOOF (L.). **Vaccination spécifique de l'Alastrim. (Note préliminaire.)**—*Ann. Soc. Belge de Méd. Trop.* Brussels. 1924. Jan. Vol. 3. No. 3. pp. 377–379.

True variola seems to have disappeared from Stanley Pool since 1912, and after 1918 to have been replaced by an attenuated disease resembling in all respects alastrim. Alastrim is differentiated from variola by its epidemiological and clinical characters as well as its biological reactions. Thus, vaccination produces little immunity against it or none at all. An attack of alastrim does not protect from inoculation with vaccinia. An attack of smallpox or of chickenpox does not protect against alastrim. Attacks of alastrim have been known to recur.

In experimental animals alastrim behaves differently to smallpox. No success in the inoculation of alastrim was obtained on rabbit, calf, sheep, goat or monkey, but the dry vaccine of the Belgian State Institute succeeded in all cases. Von Pirquet's method—repeated inoculations to create a state of sensibility— gave no result with alastrim in the monkey. Noguchi's intratesticular method was unsuccessful with alastrim in the monkey. Intracorneal inoculation of the rabbit (Paul's method) succeeded " more or less " in a single case, but the infection could not be transferred to a second rabbit. Intravenous inoculation to a monkey of pustular contents and brayed crusts of alastrim succeeded only when the skin was scarified or slightly traumatized. There is an evident affinity for the nerve centres and the integument. Pustules do not appear till the 9th day. The monkey is taken ill on the 6th or 7th. The human disease is faithfully reproduced. When the eruption appears the temperature comes down and the general state rapidly improves. These pustules and crusts can be inoculated per the skin into other monkeys—to the 8th passage. The incubation is reduced from 9 to 3 or 5 days. The pustules which now result are larger and like ordinary vaccine pustules. Generalization does not occur. The virus in adapting itself to the monkey becomes attenuated. The author has not been able to transmit the attenuated virus to rabbit or calf, but it can be inoculated to man, in whom it produces a pustule of vaccinal character and no generalization. On the other hand, attempts at variolization by means of pustules of alastrim have always given rise to more or less severe generalization.

A. G. B.

i. CAMBESSÉDÈS. **Variole ou alastrim.**—*Rev. Méd. et Hyg. Trop.* 1924. Apr. Vol. 16. No. 4. pp. 101–105.

ii. HENRY. **Notes sur l'alastrim.**—*Ibid.* pp. 106–107.

i. An account of a case of alastrim seen at Paris in a coloured patient just landed from Martinique. Unless the patient became infected on the day of sailing the incubation period exceeded 14 days.

ii. Some general remarks on the disease which the author regards as attenuated smallpox.

A. G. B.

CHAND (Wazir). **Analysis of 121 Cases of Lobar Pneumonia in the Prison Hospital, Nairobi, 1923.**—*Kenya Med. Jl.* 1924. Apr. Vol. 1. No. 1. pp. 8–17.

Consists chiefly of a series of tables with explanatory text. The Kikuyu, who are natives of Nairobi, suffered least and the Masai and Baganda most. The bulk of the cases occurred in the prisoners of terms between 1 month and 1 year, and in the months of August-October. Those who slept in tents suffered slightly more than those in barracks. There were 22 fatal cases. In the past four years 400 cases of pneumonia have occurred in this jail with 90 deaths. It is stated that overcrowding has been occupying the earnest attention of the medical authorities, but no data are given.

A. G. B.

REVIEWS AND NOTICES.

SÉGUY (E.). **Les Moustiques de l'Afrique Mineure, de l'Égypte et de la Syrie. Étude comparative des moustiques des régions méditerranéennes, de l'Europe centrale et septentrionale, leurs parasites suivi du Catalogue des Culicides néarctiques et paléarctiques.**—Encyclopédie Entomologique I.—257 pp. With 106 figs. 29 plates & 10 maps. 1924. Paris: Editeur, Paul Lechevalier, 12 rue de Tournon. [Price 45 francs broché, 55 francs carton.]

Though designed for the practical needs of those who wish to recognise the mosquitoes of a limited area of the globe this book is so generally instructive in its methods that it will be found useful everywhere, and particularly by the medical man who wants to get a sound working knowledge of mosquitoes for his own professional ends. It contains a multitude of well-executed figures, all of which are original, and it is particularly rich in information regarding breeding-places, eggs, and larvae. The classification too—though *de facto* not comprehensive—is natural, simple, and zoologically attractive. The author's attitude to jazz nomenclature, too, is eminently satisfactory: in these discordant cases the historic perspective is kept in view and the synonymy is given, but, in selecting a specific name for everyday use, precedence is given to a name that has become classical by graduation in a monograph and familiar by long currency, over an earlier—or conjecturally earlier—name that has been exhumed from long forgotten antiquarian records.

A. Alcock.

THE JOURNAL OF AYURVEDA, or the Hindu System of Medicine. Calcutta. 1924. July. Vol. 1. No. 1. pp. 1–38.

The objects of the originators of this Journal as set forth in the Introductory article are, when translated into plain language (1), to expound, to those who are unaware of them, the merits of the ancient Hindu system of Medicine, and (2) to impress upon some of its self-sufficient interpreters the simple truth that the system has to be reconciled with the scientific apparatus, if not also with the scientific experience, of the West. These objects are fairly focussed in an article on *Our Aims and Ideals*, by Captain Srinivasa MURTI, I.M.S., who expresses his belief that the best hopes for the future of Ayurveda are, not to rest content with its ancient doctrine, which in the course of time has become considerably obfuscated by some of its adherents, but to work in its spirit, making use of all the available resources of modern science in its efforts for the benefit of suffering humanity. An article entitled *Renaissance of Ayurveda*, by A. T. ROY, admits that " Ayurveda of the present day is tainted with the slough of empiricism for which a free use of the knife of reasonable criticism may be necessary " but is firmly opposed to unsympathetic criticism, and for the present looks for new life and light chiefly to the Chair for the study of Indigenous Drugs recently established in the Calcutta School of Tropical Medicine. An article on *Metals in Ayurveda* deals with the preparation and uses of mica as a therapeutic agent according to esoteric methods. Of the two remaining articles, one, entitled *A Brief History and Outlines of Ayurveda* is, so far as it goes, of the old-fashioned Aryan-legendary sort, and the other, with the fanciful title of *The Place of Bacteria in Ayurveda*, is a contemptuous disparagement of PASTEUR.

A. Alcock.

NOGUE (Mme. Maurice). **Les sages-femmes auxiliaires de l'Afrique Occidentale Française.**—Reprinted from *Bull. Comité d'Études Historiques et Scientifiques de l'Afrique Occidentale Française.* 1923. Apr.-June & July-Sept. Nos. 2 & 3. 80 pp.

One turned to these pages expecting to learn something of the professional training, nature of the work undertaken and the results obtained by the auxiliary service of native midwives in French West Africa. There is, however, practically nothing of value in this direction. Madame Nogue is designated professor in the French West African School of Medicine, and informs us that in November 1918 Doctor LE DANTEC, who organized the school, confided to her the moral and intellectual training of the pupil midwives.

The brochure is best described as the collected but discursive reflections upon this side of the problem by a woman animated by enthusiasm and sympathy who has gained insight and understanding in dealing with the young native women who have come under her guidance. The theme, however, really belongs rather to the realm of pedagogy than tropical medicine.

H. S. Stannus.

LEWIS'S LIBRARY. **Supplement 1921-1923 to the Catalogue of Lewis's Medical and Scientific Circulating Library with Index of Subjects and Authors.**—86 pp. [Price 1s. net.]

This Supplement of 85 pages includes the titles (with the net prices) of about 2,300 books, arranged in the alphabetical order of the authors' names, together with a convenient subject-index. The subjects included are, besides all the main and ancillary branches of surgery, medicine, hygiene and medical education; agriculture, anthropology, archaeology, astronomy, biography, chemistry, dentistry, electricity, engineering, geology, hydraulics, manufactures, applied mathematics, metallurgy, meteorology, mineralogy, motor cars, philosophy, physics, psychology, relativity, sociology, statistics, surveying, telephony, textiles, travel, veterinary science, and many others of more limited interest.

A. Alcock.

TROPICAL DISEASES BUREAU

TROPICAL DISEASES
BULLETIN.

Vol. 21.] 1924. [No. 11.

A CRITICAL CONSIDERATION OF THE TREATMENT OF THE MALARIAS.

By Lt.-Col. Clayton LANE, M.D.(Lond.), I.M.S. (retd.),
Sectional Editor, Tropical Diseases Bureau.

Consideration of the treatment of the malarias will of necessity under present conditions deal first with the alkaloidal derivatives of cinchona bark, particularly with quinine.

The Alkaloids of Cinchona Bark.

Roughly speaking, an acid infusion of the bark from a given species and strain of cinchona, containing the alkaloids, will in the process of manufacture be treated in one of two ways. If the bark's quinine content be not sufficiently great to permit economically of the commercial extraction of this alkaloid, the whole of the alkaloids will be precipitated therefrom by caustic soda and will be sold as *cinchona febrifuge.* According to MACGILCHRIST (1915 *a*) every batch of bark varies in alkaloidal content and cinchona febrifuge has no fixed chemical composition. PRAIN (1924), however, reports that the proportion of quinine to the other alkaloids of cinchona in the bark of a particular species grown in any locality where the conditions permit of its cultivation is remarkably constant.

If, however, the bark's quinine content be high, the sulphate is separated from the acid infusion by special means. After extraction of quinine the infusion may again be treated in one of two ways. Either the whole of the *residual alkaloids* may be precipitated by caustic soda and used for treatment under that name ; or there may be extracted, one by one, first the crystalline alkaloids by precipitation (cinchonidine as a tartrate, quinidine as an acid tartrate, and chinchonine by virtue of its insolubility in 80 per cent. alcohol), then the non-crystalline as a brittle or treacly mass thrown down by the evaporation of the spirit in which they have been dissolved and known as *quinoidine* or *amorphous alkaloid.*

The average analysis of Indian and Sumatran cinchona febrifuge and of Indian residual alkaloid are given as follows (MACGILCHRIST, 1915 *a* ; FLETCHER, 1923) :—

	Cinchona febrifuge.		Residual alkaloid.
	Indian. per cent.	Javan. per cent.	Indian. per cent.
Quinine	7·4	11·5	3
Cinchonine	18·58	26·3	35
Quinidine	22·83	5	20
Cinchonidine	5·84	20	2
Quinoidine	29·12	37·2	30
Water and ash	16·23		10

Quinine.

Confident recommendations of the most successful methods for the treatment of the malarias by quinine, in varying doses of the alkaloid or of its many salts, at varying intervals and hours, are conspicuous in the pages of this *Bulletin.* Their number induces scepticism. In attempts to determine the best method of quinine administration several procedures have been or may be followed

1. The means by which quinine exercises its beneficent effects have been investigated. Knowledge of these would enable it to be used to the best advantage.

Quinine, however administered, enters the blood. RAMSDEN, LIPKIN & WHITLEY (1918) found that after administration of quinine serum contains 2 or 3 times as much of it as do erythrocytes. MORGENROTH (1918) and SCHILLING & BOECKER (1919) found that when quinine was added to defibrinated blood the red cells contained more quinine than the serum. The conditions are different and the observations not necessarily contradictory. Returning to the work of RAMSDEN, LIPKIN & WHITLEY, within 3 minutes of injecting quinine direct into the rabbit's circulation 90 per cent. has disappeared thence. It, however, reappears :—(1) stored—slightly in lymph glands, considerably in bone marrow, and highly in kidneys, spleen and adrenals. After the intraperitoneal injection the last contains at least 700 times as much, weight for weight, as does blood. Quinine so stored is destroyed or " metabolized " by the tissues. Tested by incubating these with known quantities of quinine, its metabolism is greatest in liver, intestinal wall, muscles and kidneys. Since quinine contains merely the same elements as do hundreds of other organic bodies its metabolites can be identified only by their constitution, not by their atomic constituents ; and their constitution, identity and reactions are unknown. Metabolized quinine disappears in the body without trace in our present knowledge. (2) Quinine is expelled from the body, not at all in the faeces, unless there be diarrhoea, to a variable extent in the urine. HARTMANN & ZILA (1918) hold the percentage so excreted to vary from 15 to 35—more generally it is placed between 23 and 65 ; when 90 gr. were administered daily for 2 days it lay between 7 and 11 (RAMSDEN, LIPKIN & WHITLEY, 1918).

Quinine undergoes, then, after absorption, one of two fates. Part is ejected unchanged from the body by the kidneys, the rest, varying from 35 to 93 per cent., is broken up into unknown bodies. To which moiety is the beneficent action of quinine due ? In either case is the action direct or indirect ? The literature speaks uncertainly. On the one hand lie such conclusions as these :—" During that minute, however [before 90 per cent. of quinine leaves the circulation], the physician knows that the quinine is present in the circulation in maximal concentration, and that its full destructive effect is being exerted upon such parasites as have not reached the 'safe area' within the erythrocytes." On the other hand are these facts. BASS (1922) finds that in the cultivation in vitro of schizogonic forms of *P. falciparum* a 1 in 4,000 solution of quinine causes evident degeneration of intra-corpuscular forms within 5 hours, this quantity being equivalent to 2 grammes in the whole blood of a man of 150 lb. But, as has been noted, the rapid disappearance of quinine from the blood seems to exclude the possibility that such a concentration should ever occur there at all, certainly that it should persist for five hours. MORGENROTH (1918), indeed, estimates the quinine content of blood as only 1 in 20,000 a few minutes after intravenous injection and 1 in 150,000 to 1 in 500,000 after oral administration. KIRSCHBAUM (1923) found citrated blood containing *P. vivax* to be still infective after incubation at blood temperature for 5 to 24 hours with an equal quantity of a 1 in 5,000 solution of quinine. In eleven cases of the great Liverpool series (see below) the quinine content of the blood was estimated. In those 3 in which it was highest and quinism greatest *P. vivax* persisted longest in the peripheral blood. In one of the 3 (taking 5 gr. of quinine 3 times a day, 6 days a week for 3 weeks) the parasites never left the cutaneous circulation at all. In another RAMSDEN, LIPKIN & WHITLEY (*l.c.*) found the maximum strength of quinine to be 1 in 100,000, 27 hours after administration, in a case in which parasites persisted longer than in most cases.

The evidence suggests, then, that quinine is not specifically poisonous to plasmodia, but that it acts by producing, directly or indirectly, bodies which are. If, however, quinine act through metabolites, then, granted equal dosage and absorption, that individual in whom a large percentage of the drug is excreted unchanged in the urine is using it unsatisfactorily. We have, however, no evidence that quinine is ever completely unabsorbed or completely metabolized. Accordingly its absence from the urine may still reasonably be accepted as proof that none has been taken, but the quantity recovered does not indicate the quantity received. Warrington YORKE & MACFIE (1924) suggest as the most reasonable explanation of facts that quinine directly or indirectly destroys a percentage only of plasmodia, that this dissolution induces, through the freeing of antigen, the formation of immune body, and that the last, not quinine, destroys the remainder of the parasites and disinfests the host—provided the body has adequately reacted. Such considerations indicate that the mode of action of quinine is too imperfectly known to afford guidance as to its best method of administration.

2. Investigation of quinine resistance.—If quinine fail to cure malaria, and if the conditions under which such failure occurs could be discovered, the principles underlying effective treatment might well be established. FLETCHER (1923 *a*) has indefatigably and critically investigated reputed quinine-fastness in hundreds of persons. In one only have malaria parasites persisted in the blood after he satisfied himself personally that the quinine ordered had been swallowed. BASS (1923), too, fails to find substantiation for claims that quinine resistance exists; and RAVAUT and collaborators (1917) have disproved its existence in many cases in which it had been accepted. Similarly, Warrington YORKE & MACFIE (1924) find that when quinine ordered orally has failed to eradicate parasites from the cutaneous blood intramuscular injection has invariably produced this

result. There has been no quinine resistance. The drug has not been absorbed, possibly not swallowed. The investigation of quinine resistance has but attested the efficacy of quinine in ridding the blood of malaria parasites. It has thrown no light on its curative mechanism.

3. By comparing the percentage of recovery when quinine is administered in different ways attempts have been made to discover the best line of treatment. Owing to the impossibility of determining whether disinfestation has been attained, such " cure " has commonly implied freedom from clinical and parasitic relapse after treatment has ceased over a test period of arbitrarily chosen length. Owing to the significant but commonly overlooked conclusions independently reached by both, two only of the many recorded sets of experiments need here be considered—the Liverpool cases (STEPHENS *et al.*, 1918) and the Macedonian cases (ANDERSON, 1922).

In the Liverpool series hundreds of men were submitted between February, 1917, and May, 1918, to a number of different treatments. The test period was 8 weeks. Of the various treatments, one, 90 gr. of quinine sulphate daily in solution on each of two consecutive days, was repeated at a different season. Of 76 cases treated by it from July to September, 29, or 38 per cent., relapsed, while of 89 treated between January and April, 83, or 93 per cent., relapsed.

The Macedonian experiment was carried out under conditions of locality and control which also reasonably excluded reinfection. Using the same sets of quinine treatments on 199 cases, 92 admitted before July 1st and 107 from that date onwards, the percentages of relapse for each treatment were respectively 72, 71·4, 68·1 and 70·8 for the first period and 28·5, 35·1, 36·3 and 17·6 for the second. Of 17 controls 76·4 per cent. relapsed in the earlier period and of 27 controls 62·9 per cent. in the later. Similarly massing together the Liverpool experiments the percentages of relapse for the four quarters of the year were 96·7, 78·3, 36·5 and 64·8. The Liverpool workers did not conclude that " nice warm weather is a better cure for malaria than quinine," but held that on the evidence season has a great influence on the efficacy of quinine treatment of malaria in the class of case concerned (an influence difficult to dispute after the Macedonian confirmation), and that it is at least clear that to attempt to determine the value of a line of treatment merely by noting the number of relapses which follow it within a particular time is useless. This conclusion renders meaningless most of the vast mass of work upon which the relative values of various quinine treatments are estimated. A seasonal efficacy of treatment correlating itself with the recognized seasonal tendency to relapse is not unreasonable.

4. The stage of infection—clinical or pathological, not biological—at which quinine treatment is instituted requires notice. It has been urged by GÉNÉVRIER (1921) that malaria, like syphilis, has three stages: (i) before gametes appear, lasting 10–12 days; (ii) the intermediate condition; (iii) after visceral lesions establish themselves. The reasonableness of such division is combated by Ed. SERGENT (1921). Experience on the continent of the treatment of benign tertian malaria, deliberately induced by injection for the amelioration of general paralysis, shows that these first attacks are almost invariably cured with 5 gm. (75 gr.) of quinine sulphate. Warrington YORKE & MACFIE (1924) have confirmed these findings in a considerable series of cases—mosquito-carried as well as injected—closely followed up. They used 6 gm. in all, namely 30 grains on three consecutive days, with a relapse percentage of 1·6 in injected and 13 in mosquito cases. Moreover, a

number of paralytics have died at various periods after treatment of induced malaria. In none has close search of the organs detected plasmodia. SEGUIN's experience of ordinarily acquired malaria convinces him (1921, 1922) that recent infections are essentially curable. Such experiences, in their marked contrast to those of Macedonia and East Africa in war time, indicate another factor of a vital nature and yet one generally, perhaps completely, disregarded in comparative statistics.

5. The best route, time, medium and interval of administration and the best salt have been canvassed. By reason of the millions of persons involved the *oral route* must ordinarily be employed. Its efficacy is amply evidenced, *e.g.*, by COLLETT (1920), but the immense majority of cases are of course not published. One reason of its apparent failure FLETCHER's work has, as noted, indicated. It has been suggested that its administration in tablet form is another. It has, however, been shown that properly made tablets of quinine hydrochloride produce at least as much urinary excretion of the base as does the same quantity in solution (SEIDELIN, 1922). There has been a tendency to blame sugar coating as preventing absorption (LANGERON, 1922), but sugar cannot but rapidly dissolve in any aqueous fluid. The fault really lies in the tablet's menstruum, which, as BLANCHARD has shown (1922), may resist solubility for months and defy the attack of a hammer. It is as useless to expect absorption by solution of the quinine which lies in the centre of an impervious lump of concrete as it is unreasonable to condemn the popular, sugar coated, rapidly disintegrating tablets of proved efficacy, and yet the quality of the menstruum is rarely considered in the reports of these cases; a state of things which perhaps prompts the generally recognized advantage of solution over quinine in tablet form. MUNK (1917), MARIANI (1904), and GIEMSA & SCHAUMANN (1907) conclude from urine analysis that the less soluble salts of quinine are absorbed from the gastro-intestinal canal at least as energetically as the more soluble. MACGILCHRIST (1911), finding the maximum elimination of quinine taken fasting to be 3 to 6 hours, and taken with food 6 to 12 hours, and correlating this with a maximum gastric retention of food for 5 hours after administration, concludes that absorption is mainly from the small intestine, and that quinine, as whatever salt given, has, before absorption, been necessarily precipitated as the alkaloid by the alkaline intestinal juices. Intestinal solution and absorption, one presumes, would accordingly depend on the fineness of the resulting precipitate. On the relation of food to quinine absorption ROSS writes (1910, p. 136): " I have observed in experiments on myself that quinine taken just before a meal causes *tinnitus aurium* in about half-an-hour, this proving its rapid absorption; but taken after a meal it does not produce this effect so quickly."

There is a widely held inference (*cf.* HAY-MICHEL, 1918; MICHAEL, 1920; MCCARRISON & CORNWALL, 1919) that quinine is only effective during sporulation, that is to say, against extra-corpuscular stages, among which sporozoits, too, are apparently to be included, CARDAMATIS (1918) urging that quinine should be begun 7 or 8 hours before the paroxysm is due. Evidence has not been traced in its support. On the contrary, RIEUX (1918) observes that if quinine administration be started when schizonts are very young, growth ceases and degeneration begins. If started when these are half grown, some are killed and degenerate and some carry on to sporulation. If begun during sporulation this is not checked. In gametes change is less rapid but degeneration follows in time. Possibly the inference mentioned is an illegitimate offspring of the belief that quinine is not absorbed by erythrocytes. As noted, BASS finds that quinine in a concentration of 1 in 4,000 produces degeneration of intracorpuscular forms. The giving of quinine at a special phase of the life cycle does not appear, then, to be based on scientific observations.

For *intramuscular injection* of quinine the small bulk of fluid available renders necessary the use of a soluble salt, the bihydrochloride being commonly used. The true value of this route remains undetermined. In MACGILCHRIST'S experiments with bihydrochloride (1911) necrosis followed intramuscular injection into guineapigs so rapidly as to exclude even thrombosis as its cause. It was widespread in dilutions as weak as 1 in 150 and quinine was precipitated in and recovered from the necrotic tissues. The experiments of DUDGEON (1919) leave no doubt on this matter, and HELE (1922) reports the same finding. MARIANI, too (*l.c.*), found 60 per cent. of quinine bihydrochloride in rabbits' muscle 17 hours after its injection. Clinically, too, the sequelae of intramuscular injection can be grave or catastrophic. Apart from the reappearance in the literature of deaths from tetanus (BOREL & MAIRE, 1923), sterile injections may be followed by wide necrosis of muscle, nerve and artery (ROSS, 1914 ; FLETCHER & VISUVALINGAM, 1922–23 ; ACTON & KNOWLES, 1924 ; BASSETT-SMITH, 1923 ; and many others), and may be so painful that further experiences in that direction are refused.

On the other hand, LIPKIN (1919), using apparently the bihydrochloride, found that no unusual appearances were exhibited at the site of injection, and that quinine seemingly rapidly disappeared thence. With his finding is presumably to be correlated the widely expressed experience (CLARKE, 1914 ; CLARENC, 1913 ; FOX, 1917 ; SIMPSON-WELLS, 1917) that when oral quinine fails an intramuscular injection may result in disappearance of parasites from the cutaneous blood, after attaining which oral quinine may beneficially be resumed. McLAY (1922) has compared films taken after giving 60 grains of quinine bihydrochloride (a) by mouth, (b) intramuscularly or subcutaneously, and found that they became negative earlier with oral administration. The conditions under which intramuscularly injected quinine will produce widespread necrosis, with its terrible sequelae and without rapid absorption as distinguished from those under which the reverse seemingly holds are not determinable on existing data. MATHIEU (1922) points out that these grave potentialities for harm inherent in intramuscular injection preclude in fairness the delegation of these injections to subordinates, while the uncertainties regarding absorption exclude this route where rapid effect is essential.

There is no evidence that disinfestation is more readily obtained with intravenous than with oral quinine, but where rapid access of quinine to the blood stream is imperative, as in coma or the antecedent hyperparasitism, *intravenous medication* is very strongly advocated (GRIFFIN, 1917 ; WILLCOX, 1920 ; and many others). BRAHMACHARI (1922), to avoid the fall in blood pressure which has accompanied some of his injections, dilutes ten grains of quinine, presumably bihydrochloride, with not more than 200 cc. of normal saline, administration occupying 20 minutes. Others merely advocate slow injection, which seems to attain the same object so far as dilution in the circulation goes, although any leakage beside the vein will be of concentrated solution with its attendant risk of necrosis. If intravenous injection can be accomplished with tartar emetic for kala azar by Indian subassistant surgeons at the rate of 3 or 4 cases a minute (McCombie YOUNG, 1924), a medical man with European training has little justification for its disregard with quinine in malaria at his leisure, on the ground that it is a skilled operation.

While the risk of local damage by *rectal quinine* is such, in FLETCHER'S experience (1923 *b*), as to preclude its use, NEWHAM (1923) and DE FREITAS (1923) reaffirm its value and certainty in overcoming acute malaria.

6. Another variable constantly overlooked lies in the species of parasite concerned. For quartan malaria quinine has been reported as giving unsatisfactory disinfestation (*e.g.*, LESLIE, 1923). In MACGILCHRIST'S "minimum therapeutic dosage" experiments (1915 *b*) he found that to remove asexual parasites from the peripheral blood there was required for benign tertian malaria 0·1 gm. of quinine per 70 kilo body weight, the dosage for malignant tertian malaria being 0·15 and for quartan malaria 0·2 gm. The cases were few. No evidence seems to exist that the minimum therapeutic dose and the disinfestant value run parallel. As already noted (see this *Bulletin*, Vol. 20, p. 777) WENYON (1921), MAYNE (1920), and WALCH & WALCH-SORGDRAGER (1921) have produced evidence that quinine is more potent against the schizonts of *P. falciparum* than of *P. vivax*, whereas for the gametocytes the condition is reversed; MUEHLENS & KIRSCHBAUM, too (1921), have infected *A. maculipennis* with blood containing crescents, the donor being quininized. Evidence then accumulates that not merely biologically and symptomatically but therapeutically there are three malarias, and that the last aspect requires wider realization and investigation than it has hitherto received in estimating the therapeutic value of quinine.

Conclusions.—It does not seem possible, from these considerations, to avoid inferring that by reason of our ignorance regarding the intracorporeal reactions of quinine, of loose talk concerning quinine resistance, of the discovery that in all likelihood season affects the therapeutic efficacy of quinine, of lack of knowledge of the factors making for ready absorption of quinine from alimentary canal or muscle, and of failure to take into consideration that the action of quinine differs in early and late cases, in the different stages of development, and in the different species of plasmodium, our knowledge forms no scientific basis for determining the best line of treatment with this valuable drug, and, indeed, gives no indication as to whether such special modifications of administration as have been strongly advocated really serve any useful purpose.

A few lines of treatment are, however, at present favoured:—

(1). The Standard Treatment of the United States National Malaria Commission specially advocated by BASS (1921). Thirty grains (2 gm.) daily of quinine sulphate so long as clinical symptoms continue, or for 3 or 4 days, in 3 doses of 10 grains each, and thereafter 10 grains daily for 8 weeks, this course being held to disinfect 90 per cent. of cases.

(2). Nocht's Treatment.—1 gramme daily of the bisulphate in powder in fractional doses of 0·2 gramme two-hourly from 6 a.m. to 2 p.m., for ten days continuously, and thereafter, with certain intervals, for two months.

(3). Ross's Treatment.—A ten weeks' course entailing administration of 15 grains of quinine sulphate or hydrochloride daily for 2 weeks and thereafter 10 grains daily on 6 days a week for 8 weeks—a total of 690 grains.

The common feature of all these treatments is the prolongation of the course. ACTON and collaborators (1921) have shown that in relapses of benign tertian malaria a given quinine treatment—those tested ranged from 300 to 1,980 grains—will cure a definite percentage of cases, and its repetition will cure the same percentage of the relapsing, 8 weeks being taken as the test for cure. ROSS (1921) points out that a similar fractional curative effect follows each dose—the Single Dose Reduction Rate.

No evidence has been traced in favour of the widely expressed inference that provocatives which cause reappearance of plasmodia in the cutaneous circulation aid in any way the action of quinine.

Cinchona Alkaloids other than Quinine.

There is considerable evidence that the general disregard of cinchona alkaloids other than quinine is therapeutically unjustified and economically unfortunate. MACGILCHRIST (1915, *b*), working in Calcutta from September to December, determined on 113 prisoners the weight in grammes of the various alkaloids required to produce a negative blood examination, presumably in a thin film. Dosage was at the rate of 1 gramme per 70 kilos. body weight at each of 3 doses daily, a blood film being taken at the time of every dose. For quinine, cinchonine, quinidine and conchonidine the respective average figures were for benign tertian malaria 4·7, 5.5, 5, and 5·6 grammes, and for sub-tertian malaria 6·1, 5·6, 4·85 and 4·3 grammes. In this series quinine acted most rapidly upon *Plasmodium vivax*, cinchonidine upon *P. falciparum*. It would not necessarily follow that their capacity for complete disinfestation would lie in the same order. Judging by the minimum therapeutic dose (see p. 855), the relative curative values for the cinchona derivatives were, without distinction of the two parasites, first hydroquinine hydrochloride, next, and of practically equal value, the sulphates of cinchonine, quinine and quinidine, then, in order, optochin hydrochloride (ethyl-hydro-cuprein), cinchonidine sulphate, and, lastly, quinoidine. ACTON holds (1920) that the laevo-rotatory quinine and hydroquinine are specific for *P. falciparum*, whilst the dextro-rotatory quinidine acts more powerfully on *P. vivax*. He puts the cure rate of the cinchona alkaloids for *P. vivax* as—quinine 20 per cent., cinchonine 40 per cent., cinchona febrifuge 50 per cent., cinchonidine and quinidine 60 per cent., and quinoidine 0. ROGERS (1918) finds that in rabbits cinchonine is absorbed after intramuscular injection more completely than is quinine ; and that in man its use is less painful and causes more rapid disappearance of plasmodia than does quinine. BINI (1921) advocates cinchonine, SILVESTRI (1923) reports a few experiments in which cinchonine bihydrochloride injected intramuscularly gave less local precipitation and greater visceral accumulation of the drug than did the corresponding quinine salt, while in oral administration more of the former was excreted by the urine than of the latter. CORDES (1924) finds cinchonine less satisfactory for subtertian malaria than quinine. Quinoidine, in opposition to the conclusions of ACTON (see above), in daily doses of 6 grains (WATERS, 1916), 9 to 18 gr. (TELANG, 1916), 12 gr. (RAZZAK, 1917), is recommended as equal in action to quinine. ROW (1919) found quinoidine incapable of eradicating the parasites or preventing relapses. The contradictory evidence suggests that quinoidine varies in composition and that some of the amorphous alkaloids are valuable, others worthless.

It is of no little economic importance that further investigation, taking cognizance of the sources of error above mentioned, should put the relative value of the cinchona alkaloids on a satisfactory footing.

Other Lines of Treatment.

Neosalvarsan, so far from being curative in subtertian malaria, has been in a number of cases the cause of death, lighting up a malaria latent and recognized too late. On benign tertian malaria its immediate effect in suppressing parasites is generally marked, yet relapse has constantly been reported. Mercury and tartar emetic have failed. Splenectomy does not disinfest—may indeed induce immediate and fatal relapse (Degorce, 1913). X rays, used under certain precise conditions (Pais, 1923), are still advocated as curative. The good results reported with infusion of *Vitex peduncularis* by Vaughan (1921) have not been obtained by Chopra, Knowles & Gupta (1924). The harmala alkaloids (Gunn & Marshall, 1919–20) have proved valueless.

In spite of their imperfections—perhaps the result of our ignorance of their proper use—quinine and its allies remain invaluable and unsurpassed in the treatment of the malarias.

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LEPROSY.

VIGNE (P.). **Rapport présenté à la IIIe Conférence internationale de la lèpre.**—*Rev. d' Hygiène.* 1924. Mar. Vol. 16. No. 3. pp. 261–269.

This paper deals with the incidence of leprosy in Southern France, where the indigenous focus in the Alpes-Maritimes has greatly decreased from the 98 cases collected by BOINET and EHLERS in 1900 and is now almost extinct. On the other hand, by 1910 59 imported cases had entered the country, chiefly through Marseilles, while during the war at least 300 have been known; these were mainly in coloured soldiers from the colonies, including 173 from Senegal, 34 from Indo-China, 19 from Madagascar and 6 from Morocco; Toulouse has received a few from Spain, but no new cases are known to have arisen from them in France. Of 195 cases examined, 81 were macular, 28 nodular and 23 nerve forms.

L. Rogers.

TRUFFI (M.). **La lebbra in Sicilia.**—*Giorn. Ital. d. Malattie Vener. e d. Pelle.* 1924. Apr. Vol. 65. No. 2. pp. 746–752.

This paper is, in the main, statistical. During the period 1867–1875 PROFETA met with 114 cases of leprosy; in the succeeding six years another 32. FERRARI, for the period 1879–1893, recorded 37 cases, nearly all in the Provinces of Syracuse and Catania. TOMMASOLI collected 70, distributed amongst 27 Communes; of these 43 only were still living when his figures were published. Finally, it has been estimated that between 1867 and 1911 there have been 315 cases in Sicily. A circular letter sent to those practising in the country districts led to the reporting of 36 more, but these figures are not to be regarded as very exact. Recently the Ministry has issued orders for the compulsory notification of cases, but many of the medical men have not sufficient experience to diagnose the disease in its early stages, and, secondly, there is a tendency, as elsewhere, for patients and their relatives to conceal their state. It is probable therefore that there are several cases still unrecognized and unreported.

H. Harold Scott.

MORIN (J.). **La lèpre dans le Djoloff (Sénégal).**—*Bull. Soc. Path. Exot.* 1924. July 9. Vol. 17. No. 7. pp. 592–596. With 1 map in text. [1 ref.]

Among 60,000 to 70,000 people of two tribes 40 lepers are known, which is an under-statement. For these it is advisable to form a leper village, with separate quarters for the two affected tribes, under a European doctor, but financial difficulties will be encountered.

L. R.

DEKESTER (M.). **Observations nouvelles de lèpre dans la région de Fez (Maroc). Faits précis de contagion. Considérations prophylactiques.**—*Bull. Soc. Path. Exot.* 1924. July 9. Vol. 17. No. 7. pp. 597–605.

During 13 months up to June, 1924, 39 cases of leprosy have been added to the 104 observed since 1920 in the Fez region of Morocco, nearly all with advanced lesions of several years' duration. Examples are given of a conjugal infection and one of three children of a first marriage infected by their leprous step-mother, the abundance of biting parasites favouring infection.

L. R.

ARAUJO (Heraclides Cesar de Souza). **Frequencia e Prophylaxia da Lepra nas Guyanas e em Trinidad.**—Reprinted from *Supplemento do " Boletim Sanitario."* 1923. Dec. No. 5. 129 pp. With 60 figs. & 8 maps. 1924. Rio de Janeiro: Off. Graph. da Inspectoria de Demographia Sanitaria.

This work comprises an account of a visit to the Guianas and Trinidad, made in 1922 by the Director of the Public Health Service of Pará, to study the question of the prophylaxis of leprosy with a view to adopting new measures in the State over which he has sanitary control. The general health conditions of the countries visited have already been reported in " Brazil Médico."

Starting with French Guiana, Dr. Araujo found here no reliable statistics of the number of lepers. According to one statement there were 300, according to another, a rash generalization, there were thousands. From his own observations, necessarily incomplete, the author estimates at least 600, or 1·5 per cent. of the population. A small leprosarium was established in 1828 by the owner of an estate to accommodate those among her slaves who were infected. Seven years later the Government transferred all lepers there. Dr. STÉVENÉL, a former head of the leprosarium, was greatly averse to sequestration of lepers, saying that sanatoria should be special hospitals merely and not places for segregation. In 1891 rules were laid down for dealing with leprous patients, but these were not kept and the record was made that " Regulations neither have given nor can give any results." These views did much harm in retarding useful measures; as the author states: " The Sanitary Laws and Regulations are good, the execution of them is bad." Neither notification nor segregation was compulsory, so that in 1922 there were only 71 patients in the Acarouany Leper Asylum; 57 were males, 14 females. 17 were of the nodular type, 33 anaesthetic, and 21 mixed. There is a second small leprosarium in the island of St. Louis for infected prisoners. Here there are 30 huts with two beds each. In this asylum there were 57 patients, 52 of whom were French and 5 Arabs from Algeria. Enquiry revealed the fact that all had acquired the disease in Guiana. Their lot is a sad one; there are a few small gardens, but no land for agriculture and no distractions; they are poorly fed and are apparently untreated.

After much search the author has succeeded in obtaining copies of all Laws, Decrees, and Regulations referring to the prophylaxis of leprosy, and these are transcribed in an appendix to the account of each Colony and to them very pertinent remarks are added. Thus, orders were promulgated that all lepers who desired it should be admitted to the leprosarium, but, as Dr. Araujo points out, only a small proportion apply, whereas segregation should be compulsory. In his own words: " The sanitary organization at Cayenne resulting from the decrees appears to be very good, but these have not been carried out although twelve years have elapsed " since their promulgation. In short, as stated by JEANSELME, they are rules " pour épater " and not for execution.

Dutch Guiana was next visited, and three leper asylums were inspected, namely, Gerardus Majella (for Catholics), in Paramaribo, Groot Chatillon (non-sectarian) and Bethesda (for Protestants) in the interior, on the right bank of the Surinam River, inaugurated in 1885, 1887 and 1889 respectively. The two latter are of the agricultural colony type. Groot Chatillon is the official asylum, receiving patients irrespective of their religion, and marriage is allowed. The number of lepers in the whole Colony is believed to be about 1,500, but accurate statistics are not kept. The disease is said to have been first introduced by Africans, and later by Hindu and Chinese coolies. In the three institutions in 1921 there were 353 patients. All are under the control of the Chief of the Sanitary Department of the Colony. All cases notified by medical men, all who voluntarily present themselves, and all discovered by the police and the sanitary authorities are brought before a Board of five medical men for examination. As soon as the diagnosis is verified the patient is registered and he is sent to one of the asylums or isolated at home, while suspected cases are kept under observation and re-examined later. The leprosaria are described and photographs are given showing some of the houses, their situation and the accommodation. The patients are well cared for ; all who are able work in the fields, the gardens, the offices, the carpenters' shops, in the laundry or in the sewing-room. There is a concert room and an orchestra, and ground for tennis and football. Treatment by chaulmoogra oil, by injection and by mouth, is carried out regularly and systematically.

Proceeding to British Guiana he visited the Mahaica leprosarium, by by which he appears to have been particularly struck and of which he gives a detailed description. This has been in existence for 60 years, during which time, he was informed, one doctor and two nurses had contracted the disease. On the day of his visit there were 257 patients, of whom 164 were male ; during the ensuing month 12 more were admitted. Of the 269 there were 113 of the nodular type, 147 of the maculo-anaesthetic, and 9 mixed. The author was informed that there were no unsegregated lepers and that this figure constituted the total for the Colony ; but, he naively states, on the day he embarked for Trinidad, among the persons accompanying the Bishop of Georgetown on board was a girl affected with nodular leprosy who was " passing to and fro quite freely in absolute violation of Law 15 of 1905." As in the case of the other Colonies, he gives a transcription (in Portuguese) of the Laws and Regulations, but adds, in the case of British Guiana, that he thinks they are too stringent and doubts whether they are carried out.

Lastly he journeyed to Trinidad and visited the Leper Asylum of Cocorita and the Lazaropolis of Chacachacare in course of erection. Of the former is given a brief account of its history since its foundation in 1845 and a general description of the buildings, their arrangement and cost of upkeep. The sexes are rigidly separated, " but nevertheless some births are registered." He had been told that this asylum was very old and had many defects, and he was agreeably surprised, but apparently thought the expenses were great, for he states : " We should be indeed happy if each Brazilian State had an establishment equal to this and could spend annually 800,000 dollars in helping the lepers." There is a prison connected with the asylum in which are kept not only those sentenced to imprisonment by the Courts, but also any lepers in the asylum who commit infringements of discipline. These are under the Administrator-General of Prisons without any intervention by the asylum superintendent, except as regards diet. There were, when the author visited the asylum, 540 inmates disposed in 18 large pavilions, 12 for males, 6 for females. Children of either sex under 8 years of age were given one of the pavilions for women. He saw four or five children below the age of 6 years who were leprous, and one of the nuns who accompanied him, and who had worked there for more than 20 years, informed him that a child born there had shown signs of leprosy when two months old. He remarks that in this institution he saw worse cases of facial deformity than he had seen in any other country. Dr. Araujo greatly deplores the fact that in an establishment so well administered as the asylum of Cocorita, with so many patients isolated, of all races and origins, such abundance of material should be allowed to waste. No research was done, no clinical records even were kept, search for the bacilli was only carried out in doubtful cases, a statement from two medical men that a person is leprous being sufficient for isolation. Incidentally, he mentions that he saw a case of lupus vulgaris isolated as a leper amongst the inmates. To his questions as to which was the predominating form clinically, what percentage of each form revealed the presence of Hansen's bacillus, what were the results of the Wassermann test, there was no reply obtainable. No systematic treatment by any of the new methods is carried out, he affirms, but he nevertheless mentions that the mortality is remarkably low, only 8·5 per cent., as compared with 20 at Tocunduba. During 1920 there were 128 admissions to the asylum; of these two were doubtful, and one was not suffering from leprosy at all. Of the remainder 37 were of the nodular type, 86 anaesthetic, and 2 mixed. The total number of cases in Trinidad and Tobago is estimated to be between 700 and 800. The Regulations applicable to lepers and asylums in this Colony are transcribed without comment.

The author sums up the results of his investigations, detailed in this important record, in a final series of conclusions from which the following are abstracted :—

1. Segregation should be compulsory. 2. Agricultural colonies should be established at a distance from the centres of population, preferably on islands. 3. Limited self-administration should be allowed, with the Governor as the sole intermediary between themselves and the constituted authorities. 4. Cohabitation of married lepers should be permitted. 5. Children of leprous parents should be removed immediately after birth and education provided for up to the age of 14 years. 6. Lepers should be provided with every comfort, distractions, and even luxuries as far as possible, and should be given work to do in the garden, fields, offices, and at trades. They are far happier at work. 7. The establishment of hospitals within the leper colonies and of laboratories for diagnosis and research are essential. 8. The administrative section should be separated from the patients' area, and in the latter there should be small separate dwellings for two, four, or six patients each.

The book is a most helpful record, giving the unbiased opinion of a recognized authority on this subject relative to the conditions as they exist in countries other than his own, with useful hints as to points in which they can be improved or altered with advantage.

H. Harold Scott.

i. ARAUJO (H. C. de Souza). **A prophylaxia da lepra no Pará.**—*Brazil-Medico.* 1924. July 26. Year 38. Vol. 2. No. 4. pp. 48–50.

ii. ——. **A lepra no Estado do Pará. Estatistica de 30 mezes.**—*Sciencia Medica.* Rio de Janeiro, 1924. July 31. Vol. 2. No.7. pp. 366–369.

i. There are in the State of Pará large numbers of lepers. Prophylactic work was begun on June 28th, 1921, with the founding of a dispensary at Belém. In 6 months 600 lepers were registered there; at the end of the first year 1,359, and in June, 1924, there were 2,200, the total population being 120,000, approximately 18 per mille for Belém and 3·2 for the State. There is now a large " Lazaropolis " in Prata at which patients are received for treatment; it also contains a crèche of 20 beds for children born in Prata; there is a school for leprous children and a well-developed colony system for work and administration. Husbands and wives are allowed to live together when one or other is leprous, the healthy being examined every fortnight. The medical treatment adopted is that of HEISER—a mixture of chaulmoogra and camphorated oil in equal parts with the addition of 3 per cent. resorcin. Intramuscular injections in doses of 1–3 cc. are given twice weekly, if well tolerated.

ii. Covers much the same ground, though slight variations in figures indicate that the two papers were written at different dates.

H. Harold Scott.

DE ALMEIDA (Ribeiro). **O problema da lepra.**—*Bol. Soc. Med. Cirurg. de S. Paulo.* Brazil. 1923–24. Nov.-Dec.-Jan.-Feb. Vol. 6. 3rd Ser. Nos. 9–12. pp. 131–132.

In São Paulo the number of lepers is given as 1 per mille, attributed in part to immigration from neighbouring States. The " Model Leprosarium " in S. Paulo, instituted by Dr. Rodrigues ALVES, is insufficient to deal with all the cases. In Pará, however, the latest statistics show 1 per cent. of the population as leprous, but, writes the author, this is looked upon with indifference. It is suggested that several leprosaria of the S. Paulo type be erected at various places in the State and that notification and isolation of cases should be made compulsory.

H. Harold Scott.

BARRERA (F. de P.) & CHAVARRIA (A. Peña). **The Acute Exanthem of Leprosy.**—*Bull. Johns Hopkins Hospital.* 1924. May. Vol. 35. No. 399. pp. 147–158. With 3 plates & 4 charts. [13 refs.]

The authors have had the advantage of studying the occurrence of acute febrile exacerbations in leprosy in the three leper colonies of Colombia, with 6,500 lepers. They think these symptoms have not been sufficiently described by other authors, and prefer to call them " the acute exanthem of leprosy." They occur mostly in adult life, especially during physiologicial changes in women and in young married lepers, and may also be brought on by alcoholic excess or by chaulmoogra oil treatment. The fever reaches its height in the first three days and subsides by lysis after six to twelve, or rarely 20 days. The well-known appearances in these attacks and the accompanying breaking up of the bacilli in the lesions are next described, and the improvement, or a change from the chronic nodular to the maculo-anaesthetic form, following the reaction is mentioned, the changes being regarded as a defensive reaction against the invading bacilli; and they are inclined to agree with ROGERS that the benefit following treatment by chaulmoogra oil preparations is not due to direct action of the drug on the bacilli, but rather to some substance formed in the body under the influence of the oil, such as lipase ferment as suggested by him.

L. R.

POWELL (A.). **Hypertrophy of the Male Nipple in Leprosy.**—*Brit. Jl. Dermat. & Syph.* 1924. May. Vol. 36. No. 5. (No. 427.) p. 203. With 3 figs.

The writer recurs to this subject, and records that out of a total of 385 male lepers both nipples were enlarged in 280 and one in 10 more, and both in 3 of 7 female children below puberty, but in the child-bearing period the test is unreliable. Sections of the nipple show increased fibrous tissue, but seldom any lepra bacilli.

L. R.

LITTLE (E. G. Graham). **Case of Macular Leprosy.**—*Proc. Roy. Soc. Med.* (Sect. of Dermat.) 1924. June. Vol. 17. No. 8. p. 59. (Discussion pp. 60–61.)

The interest of this case resides in the patient having lived in England since 1896, before which she was in Calcutta for ten years. The incubation period appears to have been very long as the first signs appeared in 1917.

L. R.

PINEDA (Eloy V.). [In English & Spanish.] **Pathological Survey of the Causes of Death in Lepers at Culion. Estudio analitico de las causas de muerte en los leprosos de Culion.**—*Jl. Philippine Islands Med. Assoc.* 1924. May. Vol. 4. No. 5. In English pp. 169–178. [15 refs.] In Spanish pp. 197–200.

Since March 1922, 300 post mortems have been made at Culion on lepers dying in the colony, and the causes of death classified, the principal causes being tuberculosis 24 per cent., nephritis 16·3 per cent., bronchopneumonia 9·3 per cent., dilated heart 7·6 per cent., malaria 5·6 per cent., endocarditis 5 per cent., amoebiasis 3·3 per cent., lobar pneumonia and undetermined each 3 per cent., gangrene and leprosy each 2·3 per cent., and the remainder a variety of diseases each causing less than 2 per cent. These figures are in agreement with other records, in showing a high mortality from tuberculosis and nephritis respectively, but differ widely from those of McCOY in Hawaii who, mainly apparently on clinical grounds, attributed about 75 per cent. directly to leprosy and only 3·5 per cent. to tuberculosis. Bevan RAKE is quoted as having performed 90 autopsies in the Trinidad Leper asylums and found about 30 per cent. of the deaths to be due to tuberculosis, while in another series of 78 he found nephritis in 29·4 per cent. At Culion practically one-fourth of the lepers died of tuberculosis, and the treatment with ethyl esters of chaulmoogra oil was found to be injurious in 31 per cent. of such complicated cases. Nephritis is predisposed to by the damage to the skin and secondary infections in leprosy, while ethyl ester chaulmoograte was found to have an irritant effect on the kidneys, about 30 per cent. of the urines sent to the laboratory being positive for albumen early in the treatment. while after a half to two years' treatment of 1,120 specimens examined 95 per cent. showed albumen and 88 per cent. contained casts. Post mortem the majority of the nephritis cases were of the parenchymatous class, and no lepra bacilli were ever found in smears of the kidneys. Neoplasms caused 1·6 per cent. and beriberi 1·3 per cent. of the deaths.

L. R.

LLOYD (R. B.), MUIR (E.) & MITRA (G. C.). **The Effect of Antisyphilitic Treatment on the Wassermann Reaction in Leprosy.**—*Indian Jl. Med. Res.* 1924. July. Vol. 12. No. 1. pp. 213–220. [9 refs.]

In 16 cases of anaesthetic leprosy with positive Wassermann reactions treated with antisyphilitic remedies the reaction was favourably influenced in 12, or 75 per cent., the primary nerve cases being most improved, so the authors consider that all Wassermann positive nerve cases should receive antisyphilitic treatment. Of 46 nodular and mixed leprosy cases in 24 the reaction was similarly favourably influenced, but in the remaining 22 it was unchanged by antisyphilitic treatment, so in this case they advise such treatment only if there is a history of syphilis complicating the leprosy as well as a positive Wassermann. On the other hand, they consider that the high proportion of 62 per cent. of positive Wassermanns they found in leper children, against 17 per cent. in controls, indicates that in them the high proportion of plus reactions cannot be attributed to complicating syphilis.

L. R.

TAYLOR (J.) & MALONE (R. H.). **Complement Fixation in Leprosy with "Defatted"** *B. tuberculosis* **Antigen.**—*Indian Jl. Med. Res.* 1924. July. Vol. 12. No. 1. pp. 127–137. [11 refs.]

Antigens made from various acid-fast bacilli have been tried without success in the diagnosis of leprosy by the complement fixation test, a summary of which trials is first given, but the authors have not found any record of their use after removal of the lipoids. This they have done by means of DREYER's method of defatting tubercle bacilli by formalin and acetone, a fine grey powder being obtained, keeping well in a desiccator. A suspension of this is standardized by having an opacity equal to that of a 1–2,000 suspension of barium sulphate in 1 per cent. sodium citrate, all but very fine particles of the bacillary powder being removed by a hand centrifuge. After determining with known leper and non-leper sera the antigenic and anti-complementary power of this antigen, it is titrated in quantities of 2 to 12 drops in a system containing a total of 25 drops, which was never found to be anti-complementary. The sera of 100 lepers in the Rangoon Leper Asylum have been tested with this antigen, the fixation of 2 or more minimal haemolytic doses of complement only being regarded as a positive reaction, and all 37 nodular leprosy cases, all but 2 of 50 nerve cases, or 96 per cent., and 12 of 13, or 92 per cent., of mixed cases gave positive results, making 97 per cent. of the total cases. On the other hand, 14 non-leper, non-tubercular and Wassermann negative control sera, as well as 23 Wassermann-positive sera, gave negative results. The great majority of the leper asylum cases had had the disease for three years and longer, and the authors have not yet been able to test a sufficient number of early cases to decide the diagnostic value of the new test in them, but the high proportion of plus reactions in advanced nerve cases lead them to hope it will also be of value in early cases, in which case an important advance will accrue. They also tested the sera of 30 cases of tuberculosis, but obtained positive reactions in 20 per cent. only.

L. R.

WADE (H. W.) & LARA (C. B.). [In English & Spanish.] **A Plea for the Early Recognition of Leprosy, with Notes on Diagnosis and Methods. La necesidad del diagnostico precoz de la lepra con apuntes sobre diagnostico y metodos.**—*Jl. Philippine Islands Med. Assoc.* 1924. Apr. Vol. 4. No. 4. In English, pp. 132–140. In Spanish, pp. 159–162.

The failure of segregation in the Philippines to reduce the incidence of leprosy as rapidly as had been hoped is largely attributable to the great difficulty in finding and isolating the cases in their earlier stages. Illustrative examples are quoted of the early stages not having been recognized, and of the disease being allowed to reach a stage far less amenable to treatment before a positive diagnosis was made. The training of officers of the health service, physicians, medical students, presidents of sanitary divisions, nurses, constabulary officers and school teachers in the early signs of leprosy is, therefore, necessary, and all doubtful cases should be sent up for verification by expert medical officers, especial attention being paid to the more infectious cutaneous form of the disease, as the early nerve cases are less dangerous to the community. The early lesions are next described, the reddish brown macules and the loss of sensation to light pricks with a sharp needle and to touch being emphasized, and the loss of pigmentation in patches, while epistaxis should lead to an examination of the nasal mucous membrane for lesions. All doubtful cases should be re-examined every three months to detect the earliest definite signs. In making bacteriological examinations of suspected lesions, several smears from different lesions should be made by an actual cut into the deeper layers of the skin, and scrapings free from any material amount of blood taken, the slides dried in the air and sent to a laboratory for report. The writers conclude: " It is felt that if an anti-leprosy campaign is intensified along these lines it will be decidedly more effective." Illustrated pamphlets should be used for educative purposes.

L. R.

i. TRAVERS (E. A. O.). **The Treatment of Leprosy at the Leper Asylum, Kuala Lumpur, Selangor, F.M.S.**—*Far Eastern Assoc. Trop. Med. Trans. Fifth Biennial Congress, Singapore.* 1923. pp. 352–358.

ii. WHEATLEY (A. H.). **The Treatment of Leprosy as carried out at the Leper Asylum, Pulau Jerejak.** *Ibid.* pp. 359–362.

iii. WADE (H. W.). **Leprosy Work in the Philippines.**—*Ibid.* pp. 363–377. [5 refs.]

iv. VAN DRIEL (B. M.). **Affections of the Eye in Leprosy.**—*Ibid.* pp. 378-391. [34 refs.]

v. GUERRERO (Luis E.). **The Present Status of the Anti-Leprosy Campaign in the Philippine Islands.**—*Ibid.* pp. 392–405.

vi. TRAVERS (E. A. O.). **The Segregation of Lepers.**—*Ibid.* pp. 406-410.

i. *Vide ante* p. 514.

ii. Wheatley deals with treatment at the Pulau Jerejak leper asylum in Penang. In 1914 Heiser's intramuscular injections of chaulmoogra oil were used, and later Rogers' sodium gynocardate A and hydnocarpate intravenously, or a combination of the latter one part and sodium soyate two parts, all in 3 per cent. solution; and Muir's E.C.C.O. mixture intramuscularly and daily as a spray for the nasal mucous membrane. Reactions were followed by improvement, a succession of slight reactions best maintaining progress; a change of drug is tried when the condition becomes stationary, small doses, stopped if reactions occur, being used in eye and laryngeal complications. "With the above lines of treatment the majority of cases show signs of improvement," and notes of three parallel cases are given.

iii. Wade, of the Culion Colony, first deals with the segregation question, and points out that the compulsory isolation was intensely unpopular and that two-thirds of the leper colonists live in small houses built by themselves. This makes efficient treatment difficult, but it is not to be denied that in our present state of knowledge all cases should be segregated as early as possible, and that the frequent ill-informed agitation does harm. The limitation of financial resources prevents an ideal plan being carried out, one-third of the Health Service appropriations being already spent on leprosy work. Recent treatment in the colony is then dealt with. (See this *Bulletin, ante* p. 177.)

iv. Van Driel deals with eye affections in leprosy in Sumatra, as seen in examination of 250 lepers in the Asylum near Deli, mostly far advanced cases in Chinese, amongst whom syphilis is common, and 350 Bataks, including many early cases in a race seldom infected with syphilis in an asylum at 1,000 feet elevation; at a third asylum nearly 500 more were seen; yet he found only 9 blind patients, and only 7 due to leprosy, or 0·5 per cent. of nearly 1,300 examined. The most important lesions met with in the eye itself, after excluding those due to other diseases, were the following. The cornea frequently shows ulcers and opacities, but he thinks very few of these are leprotic in nature and he never found actual lepromata on the cornea, but a superficial punctate keratitis was found in 3 to 4·3 per cent. of cases, usually very mild and likely to be overlooked unless examined by focal illumination after instillation of cocaine and fluorescin. More frequent and important are the well-known iritis and iridocyclitis, 79 cases, or 22 per cent., being seen in one of the Batak asylums where syphilis was rare. The bacillus he thinks gains access through the blood stream, as both eyes are frequently attacked at once, this condition being the most frequent cause of blindness in lepers.

v. Guerrero deals with the present status of the anti-leprosy campaign in the Philippine Islands on the basis of figures supplied by the Health Service. From the opening of the Culion Colony in June 1906 up to May 1923, 14,832 lepers had been sent there, and 444 more are now in the San Lazaro Hospital at Manilla, making a total of 15,276 collected in 17 years. Only 5,808 now remain, 9,706 having succumbed to the disease, with the exception of a few escaped or released. During the last two five-yearly periods the reduction of admissions has been 24·8 and 8·7 per cent. respectively, while the four more heavily infected provinces show reductions between 1911–15 of 26·5, 15·5, 49·6 and 58·1 per cent., but the writer does not admit these figures as showing "a period of frank decline." During 1921 and 1922 of 1,343 lepers interned the majority, or 804, were cases of up to three years' duration, showing that new cases are arising, and the persistence of the disease is attributed to the forcible deportation to a distant island, causing concealment of cases, and to the system of segregation. The average duration of the disease of four years when discovered is sufficient to enable new infections to have occurred, especially among the more susceptible young persons, 40·8 per cent. of recent admissions being under 25 years of age. He therefore advocates the establishment of sanatoria-hospitals at central points within visiting reach of friends and relations of the inmates, and the registration and periodical examination of all contacts with lepers so as to detect early cases amenable to treatment. The separation of the children born to lepers from their parents is imperative, but is still not carried out in the leper colony.

vi. Travers urges that the ***method*** of segregation is of vital importance to success, it being essential to furnish conditions of greater comfort and happiness than in the homes of the lepers, in order to attract them voluntarily, and to permit the visits of relations and friends under careful control. A leper institution should have ample good land for cultivation with only ordinary fencing, and not be within five miles of a town or two from a considerable village. Cheap temporary wards and material for building their own houses should be supplied, with a small hospital for helpless cases. At Kuala Lumpur some fifty such houses have been built by the patients at their own cost ; they perform all the work of the colony, except treatment and clerical work, and grow their own fruit and vegetables. A daily visit of an European medical superintendent is necessary. Very similar conditions have proved successful in attracting the lepers at Lao Simmino, in Sumatra, under Dr. VAN DRIEL.

L. R.

BASSETT-SMITH (Percy W.). **The Campaign against Leprosy.**—*World's Health.* 1924. July. Vol. 5. No. 7. pp. 208-210.

The writer deals with the campaign against leprosy of the British Empire Leprosy Relief Association, giving recently published figures indicating that about 300,000 of the world's estimated 2,000,000 lepers are in British territories. To deal with these it is proposed to establish clinics at all hospitals in the infected areas, where the methods of treatment, which have resulted in many cases of permanent cure, as reported by MUIR in Calcutta, may be generally applied to early cases, with good hope of rendering them uninfective at a low cost. Further research should result in still more effective drugs being discovered.

L. R.

MCDANIEL (F. L.). **Report of a Death occurring during Treatment for Leprosy with Chaulmoogra Oil Derivatives.**—*U.S. Nav. Med. Bull.* 1924. May. Vol. 20. No. 5. pp. 594–596.

In a leper colony at St. Croix a male negro in an advanced state of nodular leprosy with laryngeal complication had several severe reactions after 1 and 2 cc. doses of ethyl chaulmoogrates from Honolulu, and also suffered from bronchitic and asthma-like attacks. In one of these he died with signs of laryngeal oedema, but no necropsy was obtained. It is stated that the records of the case are " none too full and no definite conclusions can be drawn therefrom."

L. R.

AOKI (T.), KAWAMURA (M.), KAMIKAWA (Y.) & FUKAMACHI (T.). **On the Treatment of Leprosy by the Intravenous Injection with Derivatives of Gynocard Oil.**—*Japan Jl. Dermat. & Urol.* 1924. Apr. Vol. 24. No. 4. In Japanese, pp. 364–398. With 2 plates & 10 figs. [141 refs.] [English Summary, pp. 33–43.]

These workers discuss recent treatments of leprosy, and point out that intravenous injections are less painful and more exact and rapid in their action, the sodium preparations being also soluble and free from risk of embolus formation. They record numerous experiments with these various preparations in guineapigs and rabbits. They found antileprol (ethyl chaulmoograte) and hydnocardin more toxic and irritating, especially to the lungs, than the sodium salts, all the 17 cases treated with ethyl esters suffering from severe cough. They therefore selected sodium preparations of chaulmoogra oil, especially 1 per cent. leprol solution, for intravenous injections in man at 3 and 4 day intervals; of 25 patients 2 were much improved and 7 slightly improved on intravenous injections, and of 43 on intramuscular doses 3 were much improved and 7 slightly improved. L. R.

PESTONJEE (R.), NICHOLLS (Lucius) & FELIX (J. E.). **The Treatment of Leprosy in Ceylon.**—*Ceylon Jl. Science.* (Section D. Med. Science.) 1924. June 4. Vol. 1. Pt. 1. pp. 41–46. [1 ref.]

The writers have worked in the Ceylon Leper Asylum, where they class the 489 lepers as: (1) Progressive nodular and mixed, 146; (2) Progressive anaesthetic, 4; (3) Nodular and mixed stationary for six or more months, 144; (4) Anaesthetic, stationary for six or more months with irremediable destruction of nerves, 56; and (5) Chronics resident for ten or more years with no active lesions for many years, 139; and they recognize that the last two classes, or 40 per cent. of the total, cannot be expected to improve under any treatment. They point out that: "The great majority of segregated lepers are suffering from the effect of the past active processes of the disease, such as contractures, lost digits, destroyed nerves and extensive disfigurement, and from these effects no recovery is possible." They agree with MUIR that the tendency in anaesthetic leprosy is towards complete arrest of the disease, but in Ceylon the earlier stages of this type are rarely segregated. Mixed leprosy cases are more severe and generally die from the disease within ten years. Two years ago 32 nodular cases, many of them extensively affected, were selected for treatment with ethyl chaulmoograte in Muir's E.C.C.O. mixture. At the end of this time 10 had improved, 16 had fresh lesions in the course of the treatment and showed no general improvement, while 6 had died, "the injections having been followed in many cases by a definite shrinkage or even disappearance of the nodules." During the last six months 46 earlier cases have been treated, with improvement in 19, no general improvement in 26, and one death. In two, most of the signs have disappeared. They conclude that recovery cannot be expected in the majority of the class of cases seen in leper asylums, and that treatment must be continued for several years. L. R.

MUIR (E.). **Is Leprosy Curable?**—*Indian Med. Gaz.* 1924. June. Vol. 59. No. 6. pp. 297–298.

The writer analyses his results at the leprosy out-dispensary of the Calcutta School of Tropical Medicine in 203 cases treated for from

3 to over 24 months—80 of them for under 6 months—classing them as follows: " 'A' represents nerve cases which have been diagnosed from the presence of anaesthesia and other nerve symptoms, but in which the bacteriological examination was negative for lepra bacilli. 'B' represents those cases in which the bacteriological examination was positive. A_1 represents primary nerve cases and A_2 secondary nerve cases. B_1 includes early bacteriologically positive cases, B_2 those of a more advanced degree, and B_3 cases with great lepromatous thickening of the skin and very large numbers of lepra bacilli."

TABLE OF 203 DISPENSARY CASES THAT HAVE PERSISTED WITH TREATMENT UP TO DATE, OR TO A RELATIVE CURE.

Length of Treatment in Months.

		1–3	4–6	7–9	10–12	13–15	16–18	19–21	22–24	Over 24	Total.
A1	All signs of active disease gone ..	1	4	4	7	3	6	3	2	2	32
	Still signs remaining ..	13	5	2	9	2	3	2	—	—	36
A2	All signs of active disease gone ..	—	—	—	—	—	—	—	—	—	—
	Still signs remaining ..	5	5	3	1	1	1	2	1	—	19
B1	All signs of active disease gone ..	–	—	1	4	1	1	—	1	–	8
	Still signs remaining ..	10	4	3	2	3	1	—	—	—	23
B2	All signs of active disease gone ..	—	—	—	1	—	1	1	—	—	3
	Still signs remaining ..	21	6	5	8	6	6	3	3	10	68
B3	All signs of active disease gone ..	—	—	—	—	—	—	—	—	—	—
	Still signs remaining ..	5	1	1	1	6	—	—	—	—	14
	Total	55	25	19	33	22	19	11	7	12	203

A1 = Primary nerve cases. A2 = Secondary nerve cases coming on after B^2 and B3.

B1 — Bacteriologically positive cases of 1st degree.
B2 = ,, ,, ,, 2nd ,,
B^3 = ,, ,, ,, 3rd ,,

Of the total cases 43 had lost all signs of leprosy for from three months to three years; all but five of those had been treated for six months and upwards, so that of the 123 in that category 38 or 31 per cent. had cleared up; 27 were primary nerve cases, and the remaining 11 the first and second degrees of nodular cases. On the other hand, none of the secondary maimed nerve cases or of the extreme third degree of nodular cases had completely recovered, and he mentions that he has known the treatment wrongly discredited in some leper asylums because it failed to clear up mutilated cases with lost fingers and toes, of which he observes: "Many of such cases are no more suffering from leprosy than are pock-marked people suffering from smallpox. The disease has died out and has only left scars." In the primary nerve cases treated for a year or more 16 out of 23 were freed from all signs of the disease, and this favourable proportion increases steadily as the treatment progresses, while the same holds good to a more limited extent with B_1 cases, that is early skin and nodular ones. He therefore holds that "the table shows A_1 and B_1 cases can be almost invariably freed from all active signs of the disease, and we have in our hands a method of dealing with the disease which only needs to be efficiently applied to stamp out leprosy." For this purpose it is essential to have (1) sufficient dispensaries run by trained doctors who have studied the disease, (2) diagnosis if possible in the A_1 and B_1 stage, and (3) treatment on the improved lines he has laid down.

L. R.

McCANTS (J. M.). **Leprosy in the Hawaiian Islands.**—*U.S. Nav. Med. Bull.* 1924. June. Vol. 20. No. 6. pp. 705–713. [4 refs.]

The writer reviews treatment in Hawaii after consultation with the local medical authorities. The vast majority of cases are in the Hawaiian or part Hawaiian population, who are heavy drinkers, while youth and early adult life are most affected. All suspected lepers are examined by a board of five physicians, including two bacteriologists, four of whom must agree in the diagnosis, but many lepers now come voluntarily for the sake of the present treatment, in which they have great faith; the milder cases are treated at Kahili hospital near Honolulu, and the more serious ones are sent to the Molokai colony. A standard tonic containing iron, arsenious acid, and strychnine is given in addition to ethyl chaulmoogrates, especially in nerve cases. "The recently discovered chaulmoogra-oil derivatives appear to be a specific in leprosy." The mixed ethyl esters of the entire fatty acid series of chaulmoogra oil plus 1 per cent. iodine by intramuscular injection is regarded as the best treatment, its continuous use having led to the following results: (1) Practically all early cases show marked improvement up to an apparent cure. (2) Many advanced ones show improvement. (3) About a third of all cases are sufficiently improved to be paroled; that is, an apparent cure. (4) Of 264 paroled since 1912, 40 returned with a recurrence and 22 have died from other causes. The organisms continuously disappear from the lesions. "It is believed that early detection of lepers and thorough treatment will effect a cure."

L. R.

OGILVIE (D. C.). i. [**Report of the Fiji Leper Asylum at Makogai.**] ii. **Some Observations on Leprosy.**—*Fiji Ann. Med. Report for the Year ending 31st December, 1923.* pp. 24–27.

On 1st January 1923 there were 266 lepers present at Makogai. During the year the admissions were 62, deaths 18, discharged unconditionally 4, discharged on parole 17, remaining December 31st 289, an increase of 23. The lepers worked on the farm and at the manufacture of soap. In the course of treatment over 7,000 injections were given of various drugs; moogrol and chaulmoogra oil intravenously were of benefit in some only; tartar emetic intravenously caused unpleasant fever and pain without doing any good; urotropine is valuable in cutting short the reactionary fever and swelling and also the pains of nerve leprosy, proved very effective in a case of acute nephritis, and always induces strong diuresis, the routine injection being 10–15 grains in 4–6 cc. distilled water twice a week. Of hypodermic and intramuscular remedies he found sodium morrhuate the most effective and easily absorbed, and sodium hydnocarpate better than the gynocardate. In five cases lepra bacilli obtained from nodules and defatted by Dreyer's method were injected, with improvement in three only. Tuberculosis was the most serious complication, and hookworm infections require treatment with carbon tetrachloride.

L. R.

GONZAGA (Gavião). **Applicação do enteroantigeno no tratamento da lepra.—Ensaios da vaccinotherapia. (Nota prévia.)** [The Use of Intestinal Antigens in Leprosy. Vaccine Therapy.]—*Brazil-Medico.* 1924. May 17. Year 38. Vol. 1. No. 20. pp. 280-281. With 4 figs.

Having obtained good results in cases of psoriasis and chronic eczema from injections of autogenous entero-vaccines the author tried similar methods in 38 cases of leprosy. He relates in detail two cases, aged 25 and 45 years respectively. Both had extensively disseminated patches and some ulcerated lepromata. The first patient felt so much better that he returned to work and ceased treatment after 23 injections; the second, who had suffered from the disease since 1910, received 47 injections between August 1922 and January 1923. He, too, was greatly benefited, the maculae disappeared, the tubercles became smaller and the ulcers cicatrized. This improvement had been maintained when he was seen again in March 1924. In both patients, however, the bacilli persisted in the nasal mucosa.

H. Harold Scott.

BEUKERS (C. M.). **Thymolinjecties bij Lepra.**—*Geneesk. Tijdschr. v. Nederl.-Indië.* 1924. Vol. 64. No. 2. pp. 283-284.

Beukers recommends for the thymol treatment, suggested by Moehamad HAMZAH [this *Bulletin, ante,* p. 182], the following prescription: thymol 9, camphor 3, cod liver oil 21 parts, 0·5 cc. to be injected intramuscularly every day. There is no pain and little infiltration.

W. J. Bais.

GOMES (José Maria). **Tratamento da lepra. Um caso de cura apparente.**—*Bol. Soc. Med. e Cirurg. de S. Paulo.* Brazil. 1923-24. Nov.-Dec.-Jan.-Feb. Vol. 6. 3rd Ser. Nos. 9-12. pp. 140-141. And *Ann. Paulist. Med. e Cirurg.* 1924. Apr. Year 12. Vol. 15. No. 4. pp. 77-79.

A brief account of a girl of 12 years who had shown symptoms of leprosy early in 1922. In January, 1923, there were extensive maculo-anaesthetic patches on both legs with some thickening of the skin. She was dull and apathetic and tired by the smallest effort. Lepra bacilli were found in smears of the nasal mucosa and in blood from the maculae. Injections of tarakthyl (0·5 cc. and increasing to 1 cc.) were well tolerated and there was no febrile reaction. Improvement was rapid; the patches diminished, sensibility returned and the patient lost her apathy. By October the lesions had disappeared and repeated examinations of the nasal mucosa and of blood from the old leprous sites failed to reveal any lepra bacilli.

H. Harold Scott.

SARRAUT (A.). **Circulaire du ministre des colonies au sujet de la prophylaxie et du traitement de la lèpre.**—*Ann. de Méd. et de Pharm. Colon.* 1924. Jan.-Feb.-Mar.-Apr. Vol. 22. No. 1. pp. 121-133.

Attention is called to the good results of the new treatment of leprosy obtained in several of the French Colonies. It has led to an increase in the number of lepers coming to dispensaries for advice, and has permitted early cases, with little or no infection, to be treated either as out-patients with domiciliary care and registration, or in special wards in hospitals. Particular care should be taken to prevent susceptible children coming into contact with lepers. The ethyl esters can be made from the oil of *Hydnocarpus anthelmintica* of China as well as from true chaulmoogra oil. Medical Research Institutes should have sections for the study of leprosy treatment. Cases should be classified as (1) Closed cases not giving off lepra bacilli and not contagious, to be treated in out-patient dispensaries, or if living too far away in hospitals; (2) open and contagious, to be isolated until the lesions are healed; and (3) mutilated and infirm cases requiring to be placed in asylums. The French Colonies, in a native population of 56 millions, have 80,000 to 100,000 lepers, making the disease an important problem, but with our present knowledge it is not rash to hope that if the campaign is carried out with the desired vigour, within ten years the amount of leprosy infection will be so greatly reduced that the plague may be virtually vanquished.

L. R.

PUXEDDU (E.). **La velocita di sedimentazione degli eritrociti nella lepra.**—*Riforma Med.* 1924. June 2. Vol. 40. No. 22. pp. 507–509. [8 refs.]

The velocity of sedimentation (V.S.) of red cells has been suggested as a means of distinguishing gastric carcinoma from simple ulcer, the rate being rapid in the former and about normal in the latter. The rate is increased also in malaria, tuberculosis and syphilis. The author has applied a similar test to leprosy. The method preferred is that of LINZENMEYER, the blood being received into a tube containing the anticoagulant, sodium citrate, potassium oxalate, or sodium fluoride, and the time being noted for the corpuscles to fall to a fixed point marked on the tube. In three cases of leprosy the sedimentation time varied between 60 and 90 minutes, the normal being over 7 hours. In leprosy complicated with malaria this period was still further reduced to between 50 and 80 minutes. By using the red cells of the patients and plasma from normal subjects, and *vice versa*, he showed that the increased rapidity is mainly due to the plasma. The cells of the leprous patients sedimented in normal plasma in 4 hours or a little over, whereas normal cells in the plasma of leprous patients sedimented in 70–90 minutes.

H. Harold Scott.

VALVERDE (Belmiro). **Transmissibilidade da lepra.**—*Brazil-Medico.* 1924. Apr. 26. Year 38. Vol. 1. No. 17. pp. 233–236. [3 refs.]

——. **Contribuição para o estudo do contagio e da transmissibilidade da lepra.**—*Rev. Med.-Cirurg. do Brazil.* 1924. July. Vol. 32. No. 7. pp. 355–363. [3 refs.]

In these papers the author, mainly by discussion of the case of leprosy in a lad of 16 years who had never resided out of Paris (reported by Professor JEANSELME to the Academy of Medicine in December 1923), controverts the statement attributed to LUTZ that this disease is conveyed only by mosquitoes, *Culex* and *Stegomyia*.

H. Harold Scott.

PLAGUE.

EGYPT (Ministry of the Interior). Department of Public Health. Reports and Notes of the Public Health Laboratories, Cairo. No. 5. **Plague Report.** [PETRIE (G. F.) & TODD (Ronald E.)].—114 pp. With 5 maps & 3 charts. 1923. Cairo: Govt. Press. [Price P.T. 20.]

This belated Report refers to investigations on plague in Upper Egypt between 1911 and 1913. It deals with the history of the disease before and from 1798 onward, with epidemiology, newly found rodent hosts and with fleas. But that which was new in 1913 has received full notice since the Great War. Many fleas can convey the infection, and so far as we know all rodents are susceptible to plague.

Nevertheless it has been suggested that certain portions of this Report are worthy of detailed notice. Those who wish to " look before and after " will find a helpful list of references on page 545, Vol. 19, of this *Bulletin*. After some prefatory remarks we come to a statement concerning the re-introduction of plague into Egypt in 1899. Previous records are dealt with in three stages: (1) Period ending in 1798, the year of the landing in Egypt of Napoleon's Expeditionary Force. (Prior to the seventh century records are scanty and of little value.) From the seventh to the fifteenth centuries plague epidemics were described by Arabic scholars whose manuscripts were examined by KREMER and abstracted in his monograph " On the Great Epidemics of the Orient collated from Arabic Sources." The epidemic of 1581 was described by Prosper ALPINUS, physician to the Embassy in Cairo. Other authors are mentioned. (2) The period from 1798 to 1899:—The first really systematic investigations into plague were made by French and Russian Commissions which worked, at intervals, between the years 1828 and 1843. Plague disappeared in 1844 and a free interval of 50 years followed. Then plague broke out in India, starting an Oriental pandemic and supplying materials for research to a number of Commissions sent from the chief countries of Europe. (3) Recent History of Plague in Egypt 1899–1911:—In the early part of 1897, two years before plague reappeared in Egypt, the Government sent a Commission to Bombay to study the disease. In April 1899 plague broke out in Alexandria. The exact mode of introduction is unknown, but it was part of the extension of the pandemic from Hong Kong 1894 and India 1896.

Of the fleas taken from rats and other rodents, *X. cheopis* gave 90–100 per cent. of those taken from *R. rattus*, *R. norvegicus*, Acomys and Arvicanthis trapped in houses. The first three when taken from feluccas in the cool season harboured *Leptopsylla musculi* in addition to *cheopis*. It is recorded that experiments showed the futility of using flea-killing agents to rid plague houses of fleas. The compilers state that they cannot imagine conditions more favourable to the spread of bubonic plague than those existing in Kôm Ombo:—" Back to back mud houses in a continuous row, ideal for facilitating intercommunication of rat colonies, dispersion of epizootic plague and transference of infected rat fleas to the human occupants." The compilers consider that among the climatic factors associated with plague the diurnal temperature variations deserve attention and that the gradually increasing delay in onset of plague from south to north is correlated with the seasonal variations in the climate throughout the country. It is an axiom that the spread of plague is directly related to the means of communication by rail, road or river. Examples of spread of plague are given (pp. 32–39). In Egypt two types of pneumonic plague occurred, resembling those found elsewhere: (1) mixed, (2) pure pneumonic foci; the latter may originate as primary in the lungs, or may be contracted by infection from a bubonic patient, with secondary pneumonia, removed from some other locality and without any necessary relation to plague among rodents. It is probable that houses, after removal of pneumonic cases, are harmless, apart from gross infection in the form of collections of sputum, since the plague bacillus does not thrive as a saprophyte. The writers complain that popular ignorance was the chief obstacle to removing and preventing plague in Egypt. The Bibliographical References at the end of each section will be found interesting and useful.

J. H. Tull Walsh.

LISTON (W. Glen). **The Milroy Lectures, 1924, on the Plague.**—*Brit. Med. Jl.* 1924. May 24, 31 & June 7. pp. 900–903; 950–954; 997–1001. [8 refs.]

These three lectures are worth reading, full of interesting matter and well written. They show vast research into the history of plague and they give results of the lecturer's own investigations. They do not, however, contain anything new, anything which has not been noticed in this *Bulletin* during recent years.

J. H. T. W.

THIROUX. **La marche récente de la peste à Madagascar.**—*Bull. Office Internat. d'Hyg. Publique.* 1924. May. Vol. 16. No. 5. pp. 589–591.

Except for the year 1924 this note provides little that has not been noticed in the *Bulletin* (Vols. 19, 20, 21).

After a fairly quiet period plague reappeared in January 1924, not only in Antananarivo but also in the province. In the town there were:—*Bubonic plague* 5 cases, 3 deaths; *Septicaemic* 22 cases, all died; *Pneumonic* 22 cases, 22 deaths. In Antananarivo Province the figures were:—*Bubonic plague* 231 cases, 183 deaths. *Septicaemic* 365 cases, all died. *Pneumonic* 67 cases, 67 deaths. Nothing is said about the treatment of these cases; but see Vol. 19, p. 370. [See also Vol. 19, p. 730 (COLLIGNON).]

J. H. T. W.

COLOMBANI. **La peste pneumonique au Maroc.**—*Bull. Office Internat. d'Hyg. Publique.* 1924. May. Vol. 16. No. 5. pp. 572–580. [9 refs.]

Plague is endemic in Morocco and epidemics are always occurring. "The picture of pneumonic plague in Morocco differs little in its general outlines from that seen in other epidemics." Dr. NAIN'S vivid description of symptomatology is quoted:—"Onset sudden, with rigors and fever with immediate high temperature; intense headache and general pains. The patient cannot stand and physical and mental powers are abolished. He is as one struck down and falls to rise no more." Plague serum has been used—100 to 120 cc. daily—but with little success. The author writes that for 1921–1922 the total number of cases was 69 with only one recovery. [Might we suggest larger doses of anti-plague serum ?]

J. H. T. W.

HEGGS (T. Barrett). **Pneumonic Plague in Iraq.**—*Trans. Roy. Soc. Trop. Med. & Hyg.* 1924. Mar. 20 & May 15. Vol. 18. Nos. 1 & 2. pp. 45–49.

The 1923 Outbreak :—On February 12, 1923, an Arab Sanitary Inspector of Kazimain reported that an acute fatal illness was occurring among the Bani Temim, whose tents were north-west of the city towards the Euphrates. On the 11th four bodies had been brought for burial at Kazimain. The disease had existed five days and all the cases were fatal. The Inspector suggested cholera, but when rectal swabs were examined no cholera vibrios were found. On the 15th the headquarters of the tribe were visited and one patient seen, suffering from fever, headache, dyspnoea, coughing of blood and severe toxaemia, with chest signs of universal broncho-pneumonia. The outbreak had originated on the grazing grounds, 30 miles from headquarters. From January 1st to February 17th there had been 25 deaths. The case seen at Agarguf had been taken, when ill, to these headquarters to see his family. The Civil Surgeon, with an inoculating party, at once toured the area on horseback, visiting and inoculating the various tribes. He discovered that the infection was brought by a man who, early in January, returned to camp from a visit to Baghdad. This man, two days after his return, showed a left axillary bubo, high fever with cough and blood-stained sputum ; dying on the seventh day. His father, mother and sister died with the same symptoms, but no bubo. Altogether about 50 deaths occurred and only two persons were known to have recovered. The outbreak was confined to the Bani Temim tribe.

The 1924 Outbreak.—The story is much the same : infection brought from Baghdad to the Jaboor tribe in a camp of 200 tents and about 1,800 people, 30 cases with 29 deaths, nearly all pure pneumonic plague, a few bubonic only, of which one recovered. The fatal cases of pneumonia, which occurred in the house in Baghdad from which the first case of recognized plague in the 1924 outbreak was removed to the El Jaboor tribe, were probably cases of primary pneumonic plague. It has to be recognized that cases of primary pneumonic plague may easily be missed [*cf.* this *Bulletin*, Vol. 19, pp. 542–543.] In the outbreaks of plague (1,850 cases) in Baghdad City from 1918 to 1923 not one case of primary pneumonic plague was notified. Are they being missed ?

J. H. T. W.

JITTA (N. M. Josephus). **Remarques sur la peste dans les Indes Néerlandaises.**—*Bull. Office Internat. d'Hyg. Publique.* 1924. May. Vol. 16. No. 5. pp. 563–565.

A general and statistical account of plague since its introduction into Soerabaja from India in 1911. From 2,155 victims in 1911 the disease death rate rose to 15,756 in 1914. The work of the Sanitary Service reduced the victims to 421 in 1917, but in the following years to 1922 there was an increase in the number of deaths (1922—10,936) ascribed to a spread of pneumonic plague.

J. H. T. W.

OTTEN (L.). **The Plague in Java (1911–1923).**—*Meded. Burgerlijk. Geneesk. Dienst. in Nederl.-Indië.* 1924. Pt. 2. pp. 115–248. With 2 maps, 6 charts & 18 figs. [10 refs.]

This official report, compiled by the " Head of the Plague Prevention Service," fills Part 2 of the journal. It brings together and expands much that has been previously noticed :—See this *Bulletin*, Vol. 21, p. 440 (OTTEN) ; Vol. 20, p. 741 (VAN STEENIS, OTTEN, SALM).

J. H. T. W.

LEGER (Marcel) & BAURY (A.). **Porteurs sains de bacilles pesteux.**—*C. R. Acad. Sci.* 1922. Oct. 23. Vol. 175. pp. 734–736.

Observations recently made in Senegal seem to show that in relation to endemic conditions of plague man must be considered as a reserve for the virus in addition to rats. In Dakar, natives dwelling in houses where a case of plague has occurred are taken to an isolation hospital. They are isolated for five days while the houses and their contents are disinfected. It therefore occurred to the authors to consider whether persons in contact with plague cases might be carriers of plague bacilli. By the kindness of M. BERGONIER and Dr. HECKENROTH the authors were able, on September 6th, to examine thirty natives already detained during three days. Ten of these, taken at hazard, were examined. They appeared in good health. All of them had enlarged inguinal glands, which is, more or less, the rule with African natives ; but these glands were not very large, nor were they inflamed or tender. From all ten, smears of gland juice were taken. In three of the ten—Yara Sangare, Sidi Konate and Djan Mande, from three different parts of Dakar—they were surprised to find cocco-bacilli, bi-polar, Gram negative and resembling plague bacilli. Yara Sangare and Sidi Konate were taken to the Institute for Biology. Fresh punctures were made and the extracted fluid plus physiological serum was injected into rats : 2 *M. decumanus* and 2 *M. rattus*. One of the former appeared ill on the fourth day and very ill on September 15th, when it was killed. In smears from its spleen bacilli were found similar to those taken from Sangare. From this *M. decumanus* a *Myoxus murinus* and a *M. decumanus* were inoculated. The former died in eight days, the latter in eleven. Similar bacilli were found in both. Blood from the heart of the rat No. 123, killed September 15th, gave, on gelose, a pure culture of a cocco-bacillus resembling *B. pestis*. A 48-hour sub-culture was inoculated into the peritoneum of a *M. musculus*, a *Myoxus murinus*, a *M. decumanus* and a guineapig, the doses being ⅛, ¼, ¼ and ½ cc. respectively. The two former died in 20 hours, the grey rat in 3 days and the guineapig in 26 hours. Numerous plague bacilli were found in their organs. The blood from rat No. 123 was also sown on bouillon covered with oil ; on gelatin, potato and on gelose to which lactose, galactose, mannite, laevulose or glucose was added. *Bouillon*, culture in stalactites—*Gelatin* not liquefied. *Potato* very thin growth. The two *M. rattus* inoculated in the peritoneum from Sidi Konate, 11th September, were killed—very ill—on 22nd September. Bacilli like those of Yersin were found in the organs.

Thus it is possible that healthy carriers may escape notice and supervision, and their importance in maintaining endemic plague and in spreading the disease cannot be neglected.

J. H. T. W.

WU LIEN-TEH [G. L. TUCK]. **A Further Note on Natural and Experimental Plague in Tarbagans.**—*Jl. of Hyg.* 1924. Mar. Vol. 22. No. 3. pp. 329–334. [10 refs.]

The author describes an epizootic of plague reported from Transbaikalia in the spring of 1923. He went with Dr. POLLITZER and Dr. KWAN to Soktui on June 10th and was convinced that the tarbagans in the district were suffering from plague. They were aided by Dr. SUKNEFF, head of the Russian Plague Department, who showed them his specimens and gave them a tarbagan to dissect.

The post mortem findings in this animal were :—

"Large superficial bubo on left side of neck ; salivary glands oedematous and congested ; cervical glands on left side much enlarged, showing caseous and purulent matter on section. Glands on right side of neck swollen but not purulent. Spleen enlarged and soft. Liver swollen and congested. Some clear liquid in pericardial sac. Both lungs showed congested areas, especially the right lung, almost the whole lower lobe of which was affected. *B. pestis* present in smears of all organs. Cultures and inoculation experiments on guineapigs gave positive results for plague."

The morbid conditions in other tarbagans suffering from natural plague are given in a table. All tests positive.

The experimental work is recorded in detail and the conveyance to man through *Ceratophyllus silantiewi* is discussed. [*v.* BACOT, this *Bulletin*, Vol. 16, p. 45. See also Vol. 19, p. 372 (WU LIEN TEH).]

J. H. T. W.

CLEMOW (F. G.). **Plague and the Tarabagan.** [Correspondence.]—*Lancet.* 1924. Sept. 6. p. 526.

Dr. Clemow complains that Dr. WU LIEN-TEH has not given credit to Russians and others who many years ago (1881, 1888, 1911) discovered and recorded the connexion between the tarabagan and plague infection.

J. H. T. W.

SANDILANDS (J. E.) ; HEGGS (T. B.). **The Serum Treatment of Plague.** [Correspondence.]—*Jl. Trop. Med. & Hyg.* 1924. Apr. 1. Vol. 27. No. 7. pp. 83–84.

The first letter, from Dr. Sandilands, Health Officer, Bombay, refers to a communication from Dr. Heggs (this *Bulletin, ante,* p. 441) in favour of anti-plague serum. We give Dr. Heggs' figures as quoted by Dr. Sandilands :—

	Day of Disease on Admission.		
	1 to 3.	1 to 4.	5 to 7.
Number of cases admitted ...	12	26	47
Number of deaths	2	6	23
Case mortality per cent. ...	17	23	49

[This table emphasizes a well-known and generally acknowledged fact that the earlier plague serum is injected the greater will be the benefit. Reference to the index of volumes of this *Bulletin* for the last four years will supply instances of the intravenous injection of anti-plague serum and of its great value in treating plague.]

Dr. Sandilands admits the value of the results but offers two objections :—" One is the statistical objection that the sample is too small, and the other that the low fatality among early cases may have been solely due to early general treatment in hospital." Dr. Heggs apparently implied that the virulence of the plague in Baghdad in 1923 was as great as in Bombay in 1905–1908, and is thought to suggest that the difference in the death-rate (30 per cent. and 64 per cent.) was due to the treatment of Baghdad cases with serum. Dr. Sandilands prefers to deal with more modern figures for comparison :—" The following statement shows the percentage fatality of plague in the Baghdad Isolation Hospital in the years 1920–21 with general treatment alone, and in the years 1922–23 when serum was administered.

	Cases.	Deaths.	Fatality per cent.
1919	214	67	31
1920	65	22	34
,, ...	*(60)	(17)	(30)
1921	21	12	57
1922	126	35	28
1923	127	46	36
,, ...	*(104)	(23)	(22)

* (Cases remaining after the deduction of those that were moribund on admission.)

The rest of this letter does not affect Dr. Heggs' reply, which may be in part given briefly :—" Dr. Sandilands has compared . . . . . . mortality statistics which are not truly comparable to disprove something which has not been claimed. I made no claim to statistical proof because the required data were not available. . . . . . In 1923 by using *the intravenous route in very toxic cases and larger doses* [italics ours, Sect. Ed.] we obtained some remarkable individual results. The profession in the city [Dr. Heggs is Health Officer of Baghdad] followed our hospital procedure with good results, so that this treatment now holds the confidence of the profession here."

J. H. T. W.

i. STOCKER (C. J.) & GRAHAM (G. F.). **Preliminary Notes on the Use of a Sensitised Anti-Plague Vaccine.**—*Indian Med. Gaz.* 1924. Mar. Vol. 59. No. 3. pp. 121–125. With 13 charts.

ii. STOCKER (C. J.). **Sensitized Anti-Plague Vaccine.** [Correspondence.] —*Ibid.* July. No. 7. pp. 371–372.

i. The authors are not dealing with prophylactic vaccination, but with treatment of bubonic plague with a sensitized vaccine. The sensitizing serum was taken from a sheep showing agglutinins after about four weeks. A thick emulsion of plague bacilli is made in a known volume of normal saline. This is counted and placed in the centrifuge for some time. The supernatant fluid is poured off and the sensitizing serum added. Sterilization is carried out at 60°C. for half an hour. In the majority of cases graduated doses of 10, 20 and 50 million were given on successive days, but it is recognized that this was too timid. The initial dose for an adult should be 50 million.

Results.—Only the Mardan epidemic is dealt with :—

(*a*) Of those, not prophylactically inoculated, who were treated with the vaccine, 5 out of 17 died=29·4 per cent.

(*b*) Of those, not prophylactically inoculated, who *were not* treated with the vaccine 11 died out of 18=61·1 per cent.

(*c*) Of those who *were* prophylactically inoculated and *were* treated with the vaccine 1 died out of 12=8·3 per cent.

(*d*) Figures taken from a textbook showing that mortality among the inoculated (not treated with any vaccine) was 12·5 per cent.

Illustrative cases are given.

ii. Refers to a detail in manufacture of the vaccine.

" In the first batch of vaccine used the vaccine was not heated after sensitization. And the first batch was by far the most successful."

It has been found that pigeons are capable of producing very high titre serums. These serums have not yet been tried for sensitizing.

J. H. T. W.

PRATT-JOHNSON (J.). **Plague : Combined Vaccine and Serum Therapy.** *S. African Med. Rec.* 1924. Apr. 26. Vol. 22. No. 8. pp. 170–174. [7 refs.]

The author points out that the plague bacillus owes its deadly effects to its power of rapid multiplication and invasion of the tissues. Vaccine inoculations stimulate the defensive mechanism of the patient, and thus serve to limit the growth and invasive power of the bacillus. To overcome the associated toxaemia large doses of serum given intravenously are indicated. The administration of both serum and vaccine separately has, therefore, much to recommend it from a consideration of the etiology of this disease, and from experience gained in treatment of infections of a similar type by this method. The following scheme is suggested :—

	Serum.	*Sensitized Vaccine.*
First Day ...	100·0 cc. intravenously. ...	10 million subcutaneously.
Second Day ...	60·0 to 80·0 cc. intravenously. ... 20·0 cc. subcutaneously.	25 million subcutaneously.
Third Day ...	40·0 cc. intravenously. ... 20·0 cc. subcutaneously.	50 million subcutaneously.

J. H. T. W.

MANSOOR (R.). **The Administration of Plague Vaccine.** [Correspondence.]—*Brit. Med. Jl.* 1924. July 12. p. 83.

The writer records certain cases seen by him in India which showed severe local and general reaction after one inoculation of 4·0 cc. In April he was detailed to inoculate the personnel in the R.A.F., Indian Hospital, in Baghdad.

> " I divided the people to be inoculated into three groups . . . irrespective of weight, age or physique.
>
> " Group I was given the full dose at one sitting.
>
> " Group II was given the initial dose of 2 c.cm., and the remaining 2 c.cm. six days later.

" Group III was given the initial dose of only 1 c.cm., followed by the second dose of the remaining 3 c.cm. six days later. This group included nursing sisters and a patient to whom I administered the initial dose immediately after opening an abscess in the axilla; his temperature at that time was 102°.

" The results were as follows :—

" Group I.—More than 80 per cent. developed severe reaction, both local and general, the temperature ranging from 101° to 103°. . . .

" Group II.—Only about 10 per cent. had slight fever. The local reaction was moderate.

" Group III.—Except just a little tenderness and a small zone of hyperaemia at the site of inoculation, there was no local reaction. None of them had the slightest general reaction. . . ."

J. H. T. W.

PATTERSON (J. W.). **The Administration of Plague Vaccine.** [Correspondence.]—*Brit. Med. Jl.* 1924. Aug. 9. p. 252.

The writer records some results of anti-plague vaccination at Basra in 1919. Four thousand or more natives were inoculated at dispensaries established for the purpose. As few women attended, a dispensary was opened for purdah women, staffed by two nursing sisters, where about 1,200 women were inoculated. The full dose of vaccine was given at one attendance as it was highly improbable that the natives would return for a second injection.

" I have therefore no knowledge of the severity of the reaction following inoculation in these people, but among the European, Indian, and Arab staff it was seldom that the reaction could be described as severe, few, in fact, having to cease work. . . .

" The result of this work left no doubt in my mind of the value of plague vaccine as a prophylactic measure. . . . A notable feature was the comparative immunity of inoculated individuals who continued to live in infected dwellings and the tendency of uninoculated members of the same houses to contract the disease."

J. H. T. W.

STEVENSON (W. D. H.) & KAPADIA (R. J.). **Experiments on the Toxicity and Immunizing Value of Haffkine's Anti-Plague Vaccine.**—*Indian Jl. Med. Res.* 1924. July. Vol. 12. No. 1. pp. 199–211. With 2 charts. [5 refs.]

As a virulent strain of plague is essential for the preparation of the vaccine the bacilli are initially obtained from a septicaemic human case of plague. A pure culture is obtained which on cutaneous infection of a guineapig produces death within 5 days. Large flasks, containing a litre of faintly alkaline broth, and shallow to allow aeration, are inoculated. These are incubated at room temperature in Bombay (average mean varying from 72°F. in winter to 85°F. in summer), in the dark, from one to three months or longer. After incubation the broth flasks containing growth of bacilli are heated from 56°C. to 58°C. for half an hour, killing the bacilli. Formerly Mr. HAFFKINE used to kill the germs at 70°C.; but it was found in so doing that much of the immunizing value of the vaccine was destroyed. After cooling, carbolic acid is added to 0·5 per cent. strength.

The charts show that inoculation not only lessens the percentage of deaths, but that in those inoculated rats which develop plague the date of death is deferred. Most controls died between the 4th and 6th day, while most inoculated rats did not die until the 8th to 12th day.

The immunity afforded to rats varies according to the dose of vaccine. In Table No. II the death rate diminishes from 87 per cent. in non-inoculated rats to 15·4 per cent. in rats immunized with 2·0 cc. of vaccine, while in Table III, where the rats were inoculated with only 0.25 cc., the difference of immunity at most between the control rats and the rats immunized with the most potent vaccine used was 18 per cent.

The immunity in rats inoculated with potent vaccine is, of course, dependent not only on the strength of the vaccine as well as the dose given, but also on the number of virulent living plague bacilli administered as a test, and their virulence.

The toxicity of the vaccine for rats varies with two factors :—(1) the length of time the vaccine has been incubated ; (2) the length of time the vaccine has been stored after sterilization and carbolization (in vacuum, ampoules sealed by heating the glass).

With regard to the influence of these two factors, Tables I to VII seem to show that vaccines incubated from 6 weeks to 2 months are very much more potent than those incubated more than 3 months. The length of storage does not diminish the immunizing value at nearly the same rate as it does the toxicity of the vaccines. Vaccines over 2 years old were proved to possess some protective value and vaccines of 1 year 2 months had strong protective power.

It would appear to be advisable to use vaccines incubated from 6 weeks to 2 months ; also to store them after sterilization for some months. One can then rely on a vaccine of high immunizing value and low toxicity.

J. H. T. W.

ZEISS (Heinz). **Ueber die Anwendung von Yatren auf Pestbakterien.** [The Effect of Yatren on the Plague Bacillus.]—*Rev. Microbiol. et Épidémiol.* Saratov. 1923. Vol. 2. Nos. 3–4. pp. 74–76.

The presence of 30 per cent. iodine in Yatren (iodo-oxy-chinolin-sulphonic-acid) suggested to the author that the drug might be useful as an antiseptic. His investigations go to prove :—That below 5 per cent Yatren does not destroy *B. pestis* ; but that a 5 per cent. fluid is a practically useful disinfectant. The mixture of 5 per cent. Yatren with *B. pestis* culture caused a lethal dose to become, after about 24 hours, slightly reduced in virulence.

Therapeutic experiments are in progress.

J. H. T. W.

GOLOV (D. A.) & ILOVAISKY (S. A.). **Influence de trypanosomiase sur le cours de la peste expérimentale chez les spermophiles.**—*Rev. Microbiol. et Épidémiol.* Saratov. 1924. Vol. 3. No. 1–2. In Russian pp. 75–80. [2 refs.] French summary pp. 107–108.

The authors based their experimental work on the observations of M. KOLTZOV on the relations between natural trypanosomiasis and plague in spermophilus, on the one hand, and the frequent occurrence of buboes and enlarged lymphatic glands in the same rodents taken in non-plague regions.

The spermophiles were inoculated with the trypanosome of Surra from camels, and as soon as they developed trypanosomiasis they were infected with plague by inoculation.

Only about one-third of the animals used became infected with trypanosomiasis [*T. evansi*], and animals inoculated with blood from these victims were not affected. The progress of infection depends on the age of the animal; it is rapid in young ones, slow in the old. Inoculation of these infected spermophiles with a minimum dose of plague caused death in 6 out of 8 cases.

From their experiments the authors draw the following conclusions:—

(1) To avoid errors or unlooked for results, when using spermophilus for experiments with plague, it is necessary, as a preliminary measure, to examine their blood for haemoparasites.

(2) It is possible that trypanosomiasis in spermophilus (especially young ones) is favourable to the appearance of a plague epizootic.

J. H. T. W.

MORALES VILLAZON (Nestor). [**Estudio de un bacteriófage eficaz para el bacilo de la peste.**]—*Rev. Asoc. Méd. Argentina.* 1923. Sept. [Summarized in *Rev. Española Med. y Cirug.* Barcelona. 1924. June. Vol. 7. No. 72. pp. 335–336.]

In cultures from infected rats the author observed many spots showing lysis. From these cultures three white rats and three guineapigs were inoculated. Two of the rats inoculated with bacteriophage and emulsion of *B. pestis* died without showing any bacilli at the autopsy; in the third rat, which did not receive any of the bacteriophage culture, bacilli were found. Of the three guineapigs, two were inoculated with both bacteriophage and emulsion, the third with emulsion of *B. pestis* only. One of the two guineapigs remained well and lived; the second died, but only one single bacillus could be found. In the body of the third the bacilli were numerous. [See *ante*, p. 70 (VILLAZON).]

J. H. T. W.

i. KING (W. G.). **The Hindu and Plague.** [Correspondence.]—*Brit. Med. Jl.* 1924. June 14. p. 1071.

ii. CHEREFEDDIN (Osman). **Lungenpest und der prophylaktische Wert des Pestserums.** [Pneumonic Plague and the Prophylactic Value of Anti-Plague Serum.]—*Deut. Med. Woch.* 1924. June 20. Vol. 50. No. 25. pp. 842–843.

iii. PAL (R. D.). **Intravenous Iodine Injections in Plague.**—*Indian Med. Gaz.* 1924. July. Vol. 59. No. 7. p. 348.

i. A more or less academic discussion as to "the salutary influence of the tenets of the *Bhagavata Purana* on acceptance in India of modern plague measures" [referred to in the Milroy Lectures; see above]. Colonel King writes:—"In the [Devi] *Bhagavata Purana* (whence a quotation would be of peculiar value to Hindus) I was assured that after careful search throughout the work no such reference to plague could be found."

ii. As the result of 4½ years' observation of plague in Constantinople the author concludes that anti-plague serum is not only valuable for treatment but is a prophylactic agent of great worth.

iii. Refers to unsatisfactory results after such treatment; *v.* this *Bulletin*, Vol. 17, p. 395 (VASSALLO and another reference).

J. H. T. W.

CHOLERA.

TOMB (J. W.). **A Further Note on the Efficacy of the Essential Oils in the Prevention and Treatment of Cholera.**—*Indian Med. Gaz.* 1924. May. Vol. 59. No. 5. pp. 233–235.

The "former article" to which the author refers was fully noticed in this *Bulletin*, Vol. 20, p. 736. The prescription used in 1923 was the same as that given in the original record, and the results are said to be, as before, satisfactory.

> "It should be pointed out that in some case two or three doses of the mixture will . . . stop all vomiting and purging, but . . . experience in the Mining Settlement has shewn that the mixture should not be discontinued at this point, not less than eight doses being apparently necessary in every case if recovery is to be made certain of . . . . .
>
> "The exceptional value of the essential oils mixture . . . amongst collections of coolies, or in villages remote from ordinary medical aid, will at once be apparent, since containing, as it does, no opiates or other dangerous drugs, it may safely be placed in the hands of any intelligent coolie-sardar or village headman, who can administer it according to directions either to prevent or to abort the disease as circumstances demand."

J. H. Tull Walsh.

PALMER (F. J.). **The Treatment of Cholera by Cresol.**—*Indian Med. Gaz.* 1924. Aug. Vol. 59. No. 8. pp. 381–385.

This method of treatment was first begun during the hot weather of 1923, and continued during the present year at Cachar, Assam.

> "During the War I had a certain amount of experience of cholera whilst in command of a General Hospital in Mesopotamia, and was struck by the apparent inadequacy of transfusion of hypertonic saline in many cases. . . .
>
> "I admit that the first effect of transfusion is extremely gratifying as a rule. To watch colour and pulse return to the cold and collapsed patient inspires a feeling of hope, but, alas, in my experience, the improvement is often fallacious. Collapse returns, to be again combated by saline, and followed by a shorter transitory improvement, and hope is again mocked until the end comes. . . .
>
> "Again, the first person to see a case of cholera in a labour force or lines, and often the only one, is an Indian of the compounder or sub-assistant-surgeon class, and it is highly desirable that some treatment of easy application should be immediately available, as every moment is precious."

In an outbreak of cholera in the hot weather of 1923 there were seven cases, all treated with one minim of cresol in an ounce of water every quarter of an hour. Six recovered and one died. Those that recovered had only the cresol treatment. The case that died was also transfused with hypertonic saline. Other instances of success with cresol are given and after early trials the dose of cresol was increased:—In its present form the treatment is one to four minims of cresol, according to age and size, dissolved in a similar number of ounces of tepid water. The dose is repeated every quarter of an hour for a couple of hours and then the interval between the doses is increased to half an hour, and later to an hour, two hours, etc., whilst at the same time the dose of cresol is slightly reduced.

Cresol is a mixture of meta-, para-, and ortho-cresols, but it is probable that various preparations contain varying amounts of the three constituents. These various preparations masquerade under different names and are emulsified in different ways. Some of these are unsuited for internal use, and paracresol is said to be a powerful poison. Cresol for internal use should be thoroughly miscible with cold water. No globules, however minute, of tarry fluid should remain in suspension, this being characteristic of the inferior brands. Preparations forming a thin watery, very slightly milky, fluid should not be used internally. These are generally of the crude carbolic type.

J. H. T. W.

MUKERJI (S. K.). **A Case of Suppurative Metastatic Choroiditis after Cholera.**—*Calcutta Med. Jl.* 1924. Apr. Vol. 18. No. 10. pp. 708–709.

The patient: Hindu, male, aged 28, was attacked with cholera on a return journey from Benares. He was admitted into the Campbell Medical Hospital in a collapsed state. He remained in the hospital for two weeks and was treated with intravenous saline injections. Rigor and rise of temperature followed the last injection [composition of injection not given]. Some 5 days later he was discharged. On arriving at his home he felt some discomfort in the left eye and within 24 hours became completely blind. He then went to the out-patient department of the Belgatchia Hospital. He refused admission, and hot boric compresses with atropin and dionin, locally instilled, and a saline purge were prescribed. Forty-eight hours later he returned with agonizing pain on the left side of the head. There was increased oedema of the eyelids, high tension and the anterior chamber was full of purulent exudate. There was rise of temperature and a history of vomiting. The eye was, on incision, found full of pus. Evisceration, not enucleation, was performed. The patient made a good recovery.

J. H. T. W.

KOROBKOVA (E.) & ZÉNINE (A.). **Vaccination per os contre le choléra.**—*Rev. Microbiol. et Épidémiol.* Saratov. 1923. Vol. 2. Nos. 3–4. In Russian pp. 51–54. [1 ref.] French summary p. 104.

The authors used oral anti-cholera vaccines for 348 students in the Military College; 233 received a vaccine without bile; 115 the bile-vaccine. The former vaccine was prepared with vibrios from eight sources, sterilized at 56°C. for one and a half hours. The dose—50–75 thousand million microbes—was given to fasting pupils on three consecutive days. Before vaccination the blood of the recipients (except two, 1 : 10) showed no powers, agglutinant or bactericidal. On the contrary, the blood of the same individuals, taken 18 days after the last dose, showed the presence of antibodies, agglutinins and bacteriolysins. At the end of 37 days the agglutinins disappeared, the bacteriolysins remained. The vaccine did not cause any serious reaction. They could not find any difference in the development of antibodies in those receiving the ordinary vaccine and those who took the bile-vaccine, and after these experiments they do not consider sensitization of the intestine with bile necessary. However inconclusive these considerations may be with regard to immunity [? immune antibodies], nevertheless hypodermic inoculation is employed taking into consideration such similar data, shown in the statistics, of epidemics in the past.

J. H. T. W.

MAITRA (G. C.) & BASU (J. B.). **A Short Note on the Method of successfully cultivating Cholera Vibrio from Cases of Clinical Cholera.** —*Calcutta Med. Jl.* 1924. July. Vol. 19. No. 1. pp. 1–10. [1 ref.]

" Our cases were mostly drawn from Calcutta and its suburbs, and included persons resident in the city as well as outsiders. During the time of examination they were practically in two stages of the disease, namely, the acute and the sub-acute. The classification . . . . was based on the presence or absence of bile in the stool—the presence of bile signifying the disappearance of the inflammatory conditions in the duodenum and hence sub-acute stage of the disease." The cases were examined microscopically and culturally and the value of two media was assessed after careful consideration of the results of both observations carried on side by side in each individual.

In 200 successful cultures from 200 samples obtained from about an equal number of acute and sub-acute cases, while ordinary agar medium was uniformly successful, McConkey agar failed in 80 per cent. Vibrios appeared on the agar plate and were isolated from samples which had not shown any vibrio in the film.

For cultivation of cholera vibrio, ordinary nutrient agar of pH 7·6 is a better medium than the McConkey agar.

J. H. T. W.

MEISSNER (Gertrud). **Ueber Bakteriophagen gegen Choleravibrionen.**—*Cent. f. Bakt.* 1 Abt. Orig. 1924. Jan. 14. Vol. 91. No. 3–4. pp. 149–154. With 1 text fig. [9 refs.]

The author inoculated guineapigs, intraperitoneally, with lethal doses of cholera vibrios mixed with a high titre cholera immune serum. After various intervals the peritoneal exudate was removed and inoculated into vibrio infected bouillon. After 24 hours' incubation at 37°C. the bouillon was filtered and from the filtrate further inoculations of cultures were carried out. Agar plates were also used. Vibrio bacteriophages were obtained from the bouillon and bacteriophage loculi were formed on the agar plates as shown in the text figure. Further, the author was able to recognize bacteriophage material in normal guineapigs.

J. H. T. W.

FLU (P. C.). **Over Cholerabacteriophagen.**—*Tijdschr. v. Vergelijkende Geneesk. enz.* Leyden. 1924. Apr. 26. Vol. 10. No. 2–3. pp. 196–207. [6 refs.] [English summary pp. 206–207.]

The author isolated an anti-cholera bacteriophage from a pure laboratory strain of cholera vibrios. This strain was taken, in 1915, from the stools of a cholera case in Java. The vibrios were grown on agar slopes and a 24 hour culture was suspended in saline solution (0·9 per cent.) or broth. The suspension was mixed with sufficient anhydric sulphate of soda to form a dry mass. This mass was ground in a mortar for half an hour and the fine powder suspended in 100·0 cc. broth, heated for one hour at 58°C. and divided into portions of 10·0 cc. in 10 bottles each containing 100·0 cc. of broth (pH 7·5). Each bottle was then infected with one loop full of cholera vibrios of a different strain to the ground one. After two or three days' incubation at 37°C. [sic] [Dutch " 14 days " ; in French abstract " one or two weeks "] the liquid from each bottle was filtered through Chamberland bougies and the filtrates examined for bacteriophage against 10 strains of cholera vibrios. Of these 10 strains one was found affected by anti-cholera bacteriophage. The bacteriophage is very active and shows lysis in dilutions of 10·7; but has no action on the strain from which it was isolated.

J. H. T. W.

HIRSCH (Julius). **Zur Biochemie des Vibrio cholerae. Quantitative Untersuchung des Nitratstoffwechsels.** [The Biochemistry of *Vibrio cholerae.* Quantitative Investigation of the Nitrate Reduction.]—*Ztschr. f. Hyg. u. Infektionskr.* 1924. May 28. Vol. 102. No. 3–4. pp. 503–516. With 3 text figs. [26 refs.]

In these experiments the gas-volumetric apparatus of W. STRECKER was used; a diagram figure is given. (*Ber. d. Dtsch. Chem. Ges.* 51, 997, 1918). In peptone-water cultures of *V. cholerae* nitrate salts are reduced to nitrites, the quantities being similar. The commencement of the reduction process and the period of the reaction depend on the seed-vibrios and on their growth. Up to a nitrate-content of 0·3 per cent. the speed of the reaction increases with increasing concentration. Oxygen is necessary. The nitrate-reduction is a function of the living bacterial cells.

J. H. T. W.

KOLLATH (Werner) & LUBINSKI (Herbert). **Zur Differentialdiagnose zwischen Vibrionen und** *Bacillus faecalis alcaligenes.*—*Cent. f. Bakt.* 1 Abt. Orig. 1924. Apr. 30. Vol. 91. No. 7–8. pp. 455–459. [10 refs.]

The reason for undertaking these experiments is found in a paper by STUTZER wherein he stated that among 15 " cholera-like vibrios " isolated during an epidemic in Woronesh 14 produced alkali in the culture media and were placed in the " faecalis group." It is sufficient to say, as is shown by the work of Kollath and Lubinski, that *B. faecalis alcaligenes* does not agglutinate with anti-cholera serum nor is there any agglutination of *V. cholerae* with " faecalis-serum."

J. H. T. W.

KÉPINOV (Léon). **Étude sur l'immunité non spécifique. Action immunisante des filtrats bactériens non spécifiques sur l'infection cholérique.**—*C. R. Soc. Biol.* 1924. July 4. Vol. 91. No. 23. pp. 244–246. [3 refs.]

The present note contains only results of experiments with cholera virus. Proteolytic microbes were chosen :—*B. prodigiosus* and *B. proteus*, the latter possessing greater proteolytic action than the former. As control and for comparison experiments were made at the same time with filtrates from cultures of *V. cholerae.* The filtrates were prepared according to BESREDKA's method [*ante* pp. 447–448]. The animals used were guineapigs weighing about 400 gm. The filtrates were injected under the skin (2·0 cc. for one lethal dose of *V. cholerae* and 4·0 cc. for two doses). At the end of 24–30 hours cholera virus was injected, sometimes into the jugular vein, sometimes into the abdominal cavity; the lethal dose being 1/10 of a 24 hour culture on gelose for intravenous injection and 1/10 to 1/50 when injected into the peritoneal cavity. The guineapigs prepared with a specific filtrate from cultures of vibrios showed the most feeble resistance. Some were killed by one dose. None of the 5 controls could resist two lethal doses [*cf.* BESREDKA and GOLOVANOFF *l.c. supra*]. The guineapigs protected with filtrate from *B. prodigiosus* (4·0 cc.) were most resistant; all bore one lethal dose; but 50 per cent. succumbed after two lethal doses. Guineapigs protected with *B. proteus* filtrate were still more resistant. They did not succumb either to one or two lethal doses and all the animals survived. The author concludes that:—"Vaccine action in regard to cholera infection is not only found in the filtrate from cholera cultures, but to a greater degree in filtrates of cultures of *B. prodigiosus* and especially of *B. proteus.*" Neither injections of milk, nor of deuteralbumose possess any protective action against cholera virus [*cf.* Piccininni and Scaglione below].

J. H. T. W.

SCARPELLINI (Andrea). **Il vibrione del colera: modificazioni e mutazioni nell' ambiente esterno e negli organismi viventi.** [Changes and Mutations of the Cholera Vibrio in the Living Organism and Outside it.]—*Bol. d. Instituto Sieroterap. Milanese.* 1924. Feb. Vol. 3. No. 2. pp. 85–93. [1 ref.]

This paper contains detailed laboratory work on the agglutination reaction with sugars, production of indol, etc. Certain numbered strains (Abano) were used and those from cultures compared with others taken from inoculated guineapigs. Differences in virulence are noticed.

J. H. T. W.

i. PETROVANU (Guntza). **Recherches sur l'existence du principe lytique dans la péritonite cholérique expérimentale.**—*C. R. Soc. Biol.* 1924. Aug. 12. Vol. 91. No. 27. pp. 735–736. [1 ref.]

ii. ——. **Recherches sur la présence du principe lytique vis-à-vis du vibrion cholérique dans la paroi de l'intestin grêle.**—*Ibid.* pp. 754–756. [1 ref.]

iii. POPESCU (C.). **Sur les propriétés antivibrioniennes des plaquettes du sang.**—*Ibid.* pp. 750–752. [2 refs.]

i. The lytic principle related to cholera vibrios had been found by M. CIUCA and the author in the filtrate from cholera stools; the reaction, feeble in all cases, did not affect vibrios taken from the patients; but was only visible with extraneous vibrios. The lytic action also affected certain races of *B. coli* and Shiga's bacillus. Using adult rabbits, the author concludes that peritoneal exudate collected at varying intervals has no lytic effect on vibrios either after a lethal or non-lethal dose of cholera toxin.

ii. Filtrates from washed and ground up small intestines of 4 kinds were used: (1) From normal rabbits; (2) from rabbits immunized against *V. cholerae* (Briceag strain, used for these experiments), and (3) with the "Pasteur" vibrios; (4) from rabbits which died after 24 hours from injections of cholera vibrios into the peritoneum.

The four filtrates produced no effect on the vibrios of the original culture. On vibrios taken from the blood etc., there was slight lytic action.

iii. The author states that blood platelets have a certain agglutinating effect on vibrios.

J. H. T. W.

WATANABE (Hotori), OKUDA (Oro) & AKAMATSU (Ohichi). **[On the Strains of Cholera Vibrios isolated from Cases in Osaka during the Epidemic in 1923.]**—*Tokyo Iji-shinshi* (*Tokyo Med. News*). 1924. Jan. No. 2351. [Summarized in *Japan Med. World.* 1924. Mar. 15. Vol. 4. No. 3. p. 70.]

The authors lay stress on the necessity of preparing polyvalent immune serum for the cholera vibrios because of the divergent immunological reactions with cholera vibrios, especially the agglutination tests. [*ante*, p. 450 (YAMAGUCHI and others).]

J. H. T. W.

SANARELLI (G.). **Patogenesi del colera (IXa Memoria). Il Colera sperimentale.**—*Ann. d' Igiene.* 1924. Apr. Vol. 34. No. 4. pp. 237–287. With 2 coloured plates. [25 refs.]

A long, detailed consideration of work already published and reviewed; see Sanarelli (G.), this *Bulletin*, Vol. 21, p. 72; Vol. 20. p 737.

J. H. T. W.

ENTERIC FEVERS IN THE TROPICS.

CRUICKSHANK (J. A.). **A Note on the Value of Prophylactic Inoculation in the Prevention of Chronic Carriers of Typhoid and Paratyphoid Bacilli.**—*Indian Med. Gaz.* 1924. May. Vol. 59. No. 5. pp. 232–233. [1 ref.]

The author is Director of the Pasteur Institute of Southern India, Coonoor, and his work was based upon the fact that:—" It is the chronic carrier by whom these diseases are perpetuated . . . . . if the chronic carrier could be eliminated enteric and paratyphoid fevers would cease to exist."

The records of isolated carriers were examined and the author found that in his series the percentage of chronic carriers was much higher among the uninoculated than among the inoculated. Among 1,886 British soldiers convalescent from enteric fevers who passed through the author's hands at the Parel Enteric Depot, there were 3·2 per cent. chronic carriers among the uninoculated and 0·5 per cent. among the inoculated. Details of 12 undoubted chronic carriers are given in the following " table."

Inoculation State of Chronic Carriers.

B. paratyphosus A.		
Uninoculated	2	
Inoculated with simple " T " vaccine	4	(1) 4 months before illness. (2) 18 " " " (3) 20 " " " (4) 22 " " "
Inoculated with " T.A.B." vaccine ..	2	(1) 10 " " " (2) 11 " " " (only received 1 dose).
B. typhosus.		
Uninoculated	1	
Inoculated with " T.A.B."	2	(1) 14 months before illness. (2) 15 " " "
B. paratyphosus B.		
Inoculated with " T.A.B."	1	9 months before illness.

Only 4 at most of these 12 carriers had been thoroughly and efficiently inoculated.

"Treatment of the enteric fevers by vaccines has never come into general use, although good results have been reported from time to time [see this *Bulletin*, 1916–1922 index], especially in American literature. I would offer the suggestion that these figures may be taken to indicate the advisability of again trying vaccine therapy in these diseases, at any rate in uninoculated subjects, with a view to still further preventing the manufacture of chronic carriers."

J. H. Tull Walsh.

i. FUKUSHIMA (Hisashi). **Antityphoid and Antiparatyphoid Vaccination in the Japanese Navy.**—*Far Eastern Assoc. Trop. Med. Trans. Fifth Biennial Congress, Singapore* 1923. pp. 725–728.

ii. KASUGA (Kenzo). **On the Effect of Antityphoid and Anti-paratyphoid Vaccination in the Japanese Army.**—*Ibid.* pp. 729–732. With 2 charts.

i. In the Japanese Navy antityphoid and antiparatyphoid vaccination has been compulsory for petty officers and men since May 15th, 1916. Both grades receive the "T.A.B." vaccine every year and recruits are inoculated, for the first time, within a month of their enrolment. For recruits the doses are 0·5 cc. and 1·0 cc. For those previously vaccinated there is, from the second year, only one injection of 0·5 cc.

The results have been striking. Since 1917 the annual number of cases and carriers has never exceeded 0·67 per 1,000 of the average strength. The usual precautions are taken to lessen the local and general reactions after vaccination. Violent post-vaccinal reaction is rarely met with. Still the unfortunate martyrs of vaccination since 1916 have numbered five, one case each in 1916, 1918, 1920 and two cases in 1922. This corresponds to one death in every 167,670 injections. None of these deaths occurred among recruits inoculated for the first time.

ii. It was in 1908, when a great many cases of typhoid occurred in the section of the Army stationed at Hokkaido, that prophylactic vaccination against typhoid was carried out, for the first time, in the Japanese Army. It has been recognized that the death rate among inoculated has decreased to about one-ninth of the rate before the War. But with regard to the non-inoculated there is no difference before the War and after it. The adoption of prophylactic vaccination against typhoid and paratyphoid has reduced in a marked degree the number of cases in the Japanese Army.

J. H. T. W.

DUNCAN (J. T.). **A "New" Salmonella from a Case of Enteric Fever.**—*Jl. of Hyg.* 1924. July 31. Vol. 22. No. 4. pp. 402–409. With 4 figs. [4 refs.]

The bacillus described was taken from the circulating blood of an Indian seaman admitted to the Royal Albert Dock Hospital under Dr. G. C. Low. The patient presented all the common clinical features of enteric fever, with two attacks of intestinal haemorrhage. Widal tests were negative with ordinary strains of typhoid and paratyphoid bacilli. A culture made on admission yielded a bacillus, referred to as the *Alphonso* strain, possessing morphologiaclly the general characters of the Salmonella group. Absorption tests with 11 types from the

National Collection of Type Cultures showed that only a Salmonella *Type* " G " serum was completely absorbed by *Alphonso* at a titre of 1/100. Details are given of the serum tests applied. They definitely established the identity of *Alphonso* as a Salmonella and apparently a strain of *Type* " G," which was isolated at the Lister Institute in 1917 from the mesenteric gland of a monkey but has not before been reported from man. It was the cause of a typical enteric fever. Such cases, in which serological tests with the recognized stock suspensions have failed, occur frequently, and failure of the ordinary " T.A.B." vaccine has also been noted. The author is of opinion that wider application of cultural methods for diagnosis, especially in the tropics, would undoubtedly add to the list of bacteria recorded as causative agents in enteric fever.

J. H. T. W.

BURGESS (Edwin). **Some Living Aberrant Forms of** *Bacillus typhosus*.—*Ceylon Jl. Science.* (Section D. Med. Science.) 1924. June 4. Vol. 1. Pt. 1. pp. 33/40. With 2 plates. [7 refs.]

Variation among bacilli of the *Enterica* group is so well known that detailed notice is not necessary. These aberrants frequently return to type after culture for a year or so. See this *Bulletin*, Vol. 16, pp. 448/449, 450 ; Vol. 17, pp. 409/410 (GARROW).

J. H. T. W.

MISCELLANEOUS.

MINISTRY OF HEALTH. **Memorandum on Encephalitis Lethargica.**—12 pp. Memo. 45 Med. Revised. 1924. London : H.M. Stationery Office. [Price 1d. net.]

Encephalitis lethargica is here described—with express disapproval of its misleading popular name, " sleepy sickness "—as an infectious disease of world-wide occurrence, most prevalent in winter and spring, attacking all ages—but with a preference for the early and middle periods of life—and both sexes almost equally, and having as one of its most characteristic manifestations a progressive lethargy due to a lesion in or about the nuclei of the third pair of cranial nerves. No causal parasite has been discovered, and although most workers everywhere have failed to transmit the disease to animals, a virus obtained from human cases has, in some few instances, provoked the characteristic lesions in monkeys and rabbits by inoculation. According to LEVADITI the virus is identical with that of herpes, but since FLEXNER has obtained a virus identical with that of herpes from the cerebrospinal fluid of a nerve case that did *not* exhibit the signals of encephalitis lethargica, LEVADITI'S conclusion must for the present be received with some hesitation. Other workers have attributed the disease to a quite different virus—a virus (probably a minute protozoon) derived probably from the spontaneous encephalitis of rabbits ; and the disease has also been assigned, but without sufficient proof, to various bacterial organisms. The malady, at any rate, is of low infectivity, and appears to be one of that group of maladies where the pathological agent is frequently present, but latent, in the human organism ; and an attack may be regarded either as the breakdown of an established resistance, or as an independent infection with a specifically virulent strain of virus.

The course of the disease includes an unspecified term of incubation; a prodromal period usually lasting 7 days, but occasionally extending to 2 or 3 weeks, during which lethargic somnolence, headache, and diplopia are suggestive symptoms that occur; and an acute febrile stage (101°–102°F.) of marked asthenia, stupor (often alternating with nocturnal delirium), difficulties of speech, and twitchings of face and limbs. Transient skin eruptions—erythematous, petechial, papular, morbilliform, or scarlatiniform—occasionally occur early in the pyrexial stage. In a type of the disease having various definite localizations in the central nervous system early paralysis of accommodation, with diplopia, is very frequent, and progressive paralysis of the muscles supplied by the facial nerve, of the eye-ball, pharynx, tongue, etc., and even of the limbs, may occur. In the severest cases the patient lies like a log, perhaps cataleptic, and cannot be roused. More often he lies in a profound sleep, but can be wakened. Case mortality ranges between 20 and 50 per cent. Death occurs most frequently in the third week.

Mild or abortive—but infective—cases should be watched for; the symptoms may be merely naso-pharyngeal catarrh, dryness of throat, stiffness of neck, and headache; or slight lethargy, apathy, and headache; or slight fever and transient eye-symptoms and facial paralysis; "epidemic hiccup" even may be suggestive.

The more important sequelae are (1) mental, of all degrees of severity, usually in children or young adults; (2) a condition—one of the gravest—much like, and perhaps identical with, paralysis agitans; this also may occur in juveniles; (3) excito-motor—muscle spasms or contractions, slowed movements; (4) increased muscle tone, paralysis, various sensory symptoms, and curious respiratory spasms.

The first definite clinical and pathological study of this disease (13 cases at Vienna) was made by von ECONOMO and von WIESNER in 1917. But scattered through the medical literature of the last four or five centuries are many records of cases and epidemics of somnific or comatose fevers associated with nerve-symptoms or paralysis, which possibly may correspond with the various types of encephalitis lethargica now recognized; one such epidemic, at Tubingen, in 1712, is said to have been called "Schlafkrankheit." In quite recent days (1918), in England, a large number of cases of this disease were mistaken first for botulism and then for the cerebral form of acute poliomyelitis.

This interesting Memorandum also supplies information as to action to be taken by the M.O.H. It is indeed "good pennyworth."

A. A.

SMITH (Lawrence Weld). **Epidemic Encephalitis (Encephalitis Lethargica). Report of an Outbreak occurring in the Philippine Islands, with Notes on the Pathological Findings.**—*Philippine Jl. Sci.* 1924. Jan. Vol. 24. No. 1. pp. 1–21. With 1 chart in text & 5 plates. [23 refs.]

This epidemic of encephalitis lethargica seems to have had no relation, simultaneous or successive, with influenza; its spread was "as mysterious as that of anterior poliomyelitis or influenza itself." This report refers to the laboratory observations exclusive of bacteriology. The spinal fluid, tested by Fehling's solution, usually shows a slight increase of sugar. The blood may show a slight polynuclear leucocytosis. The gross pathological changes, which are slight and often negligible, consist mainly of general congestion of the viscera and central nervous system, with occasional punctate haemorrhages of corpora striata, medulla, or cervical cord.

The histological changes are perivascular infiltration of the central nervous system, occcasional capillary haemorrhages, and rare degeneration of nerve-cells. In ten cases a characteristic skin lesion occurred, which passes through four stages—macular, papular, vesicular, and furfuraceous. The macules—dull, dusky-red and measles-like—begin on the face and neck, extend slowly over the trunk and arms, and then over the thighs. As they develop they become discrete and punctate retaining the dusky-red colour. The vesicles are minute (1 to 2 mm.), serous, and occasionally slightly umbilicated.

A. A.

ROEGHOLT (M. N.). **Appendicitis in Indië.**—*Geneesk. Tijdschr. v. Nederl.-Indië.* 1924. Vol. 64. No. 3. pp. 428–450.

Against the assertion that appendicitis is rare in the tropics Roegholt publishes his surgical experience in Java, of 57 cases, 50 of which were operated upon (34 Europeans and Eurasians, 4 Chinese and 12 natives). A brief clinical and anatomopathological description of these cases is given, which does not differ from similar series in Europe. Roegholt remarks that the pathologic conditions, generally accepted as causing appendicitis (metastatic infection by way of the blood, by the lymph-vessels, direct from the intestine, traumatic influences) are certainly common enough in the tropics. It is said that appendicitis is rare in natives, but the fact that these patients do not report for treatment is no proof that the disease does not occur in the Malay race. [The annotator, who is in charge of an *indentured* Javanese labour force under strict medical control for over 12 years, has seen not more than three cases of appendicitis during that time, and accordingly can confirm the rarity of the disease in this race. Roegholt's article does not solve the question.]

W. J. Bais.

SHELTON (C. F.). **Two Cases of Interest from Arusha District.**—*Appendix VI. Tanganyika Territory. Ann. Med. Rep. for the Year 1922.* pp. 91–92.

One case was an appendix abscess in a native youth of about 18, admitted with a temperature of 101·8°F. and tenderness and rigidity in right iliac region, and having a history of repeated attacks of local pain, often with vomiting, for about a year. At operation a large abscess was found below and internal to caecum and was cleared of thick offensive pus and drained. The appendix was not looked for. A good recovery was made, the last drainage-tube being removed on the 15th day after operation.

The other case was double pyosalpinx in a native aged about 20. At operation two large tubo-ovarian abscesses were found, adherent to surrounding parts, particularly to the rectum. Though gonorrhoea is not uncommon among the women of the locality, pelvic complications appear to be quite exceptional.

A. A.

LIPIŃSKI (Witold). **Sporotrychoza błon śluzowych, spowodowana przez nowy gatunek Sporotrichum.** (*Sporotrichum Cracoviense* **n. sp.) Un cas de la Sporotrichose des muqueuses, occasioné par une nouvelle espèce de Sporotrichum** (*Sporotrichum Cracoviense* **n. sp.**).—*Medycyna Doświadczalna i Społeczna.* Warsaw. 1924. Mar./Apr. Vol. 2. No. 3–4. pp. 153–169. With 7 text figs. French summary pp. 168–169. [27 refs.]

Report of a case of sporotrichosis of the mucous membranes occurring in a child, aged 10 years, in whom the lesions resembled a false membrane covering the tongue and palate, with small pin-head-sized nodules and ulcerations. The fungus obtained was recognized as a peculiar Sporotrichum to which the denomination *S. cracoviense* is given. Among the cultural characteristics described may be mentioned: (*a*) Growth on all media not requiring sugar, (*b*) appearance of growth in 24 hours, (*c*) fungus lives both as aerobe and anaerobe, (*d*) lack of any pigment in the cultures, (*e*) pleomorphism, etc., etc.

W. Jenkins Oliver.

LLERAS ACOSTA (Federico), VICENTE HUERTAS (José) & ESGUERRA (Carlos). [**La epidemia actual de Bucaramanga.**]— *Repert. de Med. y Cirug.* Bogotá. 1923. June. Vol. 14. No. 9. (No. 165). pp. 356–358.

A further statement on the identity of " Bucaramanga Fever," in the form of a communication from local members of a conference held with a Commission from the Rockefeller Foundation sent out to study the disease. [See PERALTA & others: this *Bulletin*, Vol. 20, p. 911.] On the day of the latter's arrival a definite case of yellow fever occurred with typical symptoms and sera taken from patients and convalescents gave positive results with Pfeiffer's reaction and agglutinated *L. icteroides* but not *L. icterohaemorrhagiae.* The Commission decided that the disease was true yellow fever. The authors state that they themselves were quite aware of this and they resent the fact that their word was not taken. The decision of the Commission was accepted without any dissent.

H. Harold Scott.

MONTEL (M. L. R.). **Etudes de pathologie annamite en Cochinchine.**— *Bull. Soc. Path. Exot.* 1924. June 11. Vol. 17. No. 6. pp. 434–464.

This is a paper of more than common interest. The author has spent 23 years in Cochin-China, a country of 3¾ million inhabitants, and at the Municipal Clinic at Saigon and in private practice has examined and treated more than 150,000 patients. He passes in review not only the incidence of various diseases but the effects upon that incidence of race and environment, and for this purpose discusses at the outset the Cochin-Chinese patient, the country and the dietary régime.

The patients are for the most part semi-indigent, living under deplorable conditions of hygiene and nourishment. Almost all suffer from under-nutrition, and are thin and anaemic; persons with normal musculature are exceptional: arterial hypotension is the rule; the oculocardiac reflex, evidence of vagotonia, is usually present and much exaggerated. It is exceptional to see an uncomplicated disease. The author instances a patient with trachoma, chronic malaria, old syphilis, asthma and emphysema, besides the usual intestinal polyparasitism and pretibial oedema with slight polyneuritis, who comes to hospital for itch and phagedenic ulceration of the foot. Malaria, tuberculosis, syphilis and beriberi are nearly always present.

Cochin-China is a hot humid delta with a most depressing climate; the alluvial soil contains no lime; the water is entirely wanting in mineral salts, particularly lime, and is acid. The native is fed almost exclusively on rice, which is polished and hence deprived of most of its mineral matter as well as proteins. Chemical analysis has shown that the vegetables and cereals of Cochin-China are much poorer in mineral matter than those of Europe.

Immunity from certain diseases.—The native of Cochin-China is of course susceptible to all infectious diseases with the possible exception of scarlatina. The author has never seen a case of this fever nor has one been reported.

Insusceptibility to certain diseases.—Diseases of nutrition, such as gall-stones (cholesterin), urinary calculus (uric acid), gout, diabetes, are rare in these natives. Cholesterin stones in the gall bladder are never seen; the rare ones met with are of bilirubin. In Europeans gall-stones occur in 10 per cent. of men, and 25 per cent. of women. Japanese figures are intermediate, and even in Japan nearly 70 per cent. of the calculi are of bilirubin. DE LANGEN, whose work led the author to the present study, is here referred to [see this *Bulletin*, Vol. 20, p. 648]; in the Dutch East Indies the findings are the same as in Cochin-China. As DE LANGEN remarks, this is upsetting to those who hold the theory of infective origin of biliary calculi, for infections (typhoid, dysentery) are much more frequent than in Europe. DE LANGEN showed that whereas the blood cholesterin mean in the European was 1·5 gm. per litre, in Java it was only 0·88. Probably the same is the case in Cochin-China, and the poverty of the diet in cholesterin is noted; the natives do not consume either milk or eggs and meat very rarely. The author has never seen a case of uric acid stone in the kidney, though phosphatic stones are common enough in kidney and bladder, particularly in the young. Once only was an affection seen which could be called gout, and this was in a fat Europeanized native. Chronic gout is quite unknown. Diabetes is extremely rare, but less so in the well-to-do classes; ten cases were seen, all in this class. In the wealthy Chinese it is common enough, more so than in Europe, and in the caste Hindus in Cochin-China diabetes is of extraordinary frequency. Reference is again made to DE LANGEN.

Other diseases relatively rare in Cochin-China are acute and chronic rheumatism and nodular rheumatism; but it is noted that articular rheumatism is not uncommon in Tonkin, a damp country with a winter season.

Susceptibility to certain diseases.—The most important affection here is tuberculosis, especially of the lungs. It is generally believed that this disease develops more rapidly than in Europe with predominance of caseous and destructive forms, rapidly generalized in the whole lung. The author does not subscribe to this view. He has met chiefly with fibrous forms progressing slowly. He knows some twenty cases in which recovery has ensued, and believes that spontaneous cure is not rarer than in Europe. However, the native of Cochin-China has less immunity than the European, and is consequently more susceptible to the pulmonary form. In these natives haemoptysis is frequent, much more so than in Europe, and is a common cause of death. It may be so profuse that the subject dies in the street. It is part of the special liability to bleed possessed by the Cochin-Chinese. Tuberculosis of the larynx closes the scene in pulmonary tuberculosis more often than in Europe, but tubercular peritonitis is unusual. Tuberculosis of the joints and skin is very rare in the Annamites of Cochin-China as long as they remain in the country, but the same Annamite in Europe becomes as susceptible, if not more so, than the European; this was noticed in the Annamites serving in France in the War. The author would attribute this insusceptibility to the sun's action, a sort of involuntary heliotherapy, and says that it is generally known that lupus is far rarer at Marseilles than in Northern France. The frequency of the pulmonary form of tuberculosis is attributed to the comparative absence of infection in childhood, and to the climate and deficient régime; the absence of lime, which is known to favour the coagulation of the blood, may cause the tendency to haemorrhage, especially in tuberculosis. Bovine tuberculosis is almost unknown, and the Annamites never drink milk. DE LANGEN in Java attributes the frequency of pulmonary tuberculosis to hyperglycaemia favouring the development of the bacillus and hypocholesteraemia enfeebling the resistance of the native.

Asthma is much more common than in Europe, and there is a special tendency to acute affections of the lung, and particularly the pneumococcus, but less so than in the coloured races.

Beriberi is common and may complicate any disease; the author puts it that the peripheral nervous system of the Annamite is particularly vulnerable. As DE LANGEN suggests, this may be due to his hyperglycaemia. The author notes his predisposition to arterial hypotension with debility of cardiac muscle; thus the beriberic tends to sudden collapse. The cardio-vascular system of the Annamite is much more labile than that of the European.

Syphilis in Cochin-China presents itself under much the same aspects as in Europe, but the secondaries are in general more florid; large chancres are frequent. Tabes and general paralysis are rare. The first case of tabes in an Annamite was recorded in 1916 [see this *Bulletin,* Vol. 12, p. 131]; another has been seen since, but not a single instance of G.P. Indian and Japanese experience of these diseases is cited. In North China neither is met with, but at the Hospital for the Insane, Canton, G.P. is not infrequent, and tabes is sometimes seen; these patients, however, come from south, not "continental" China, and are mostly sailors. Of 13 cases examined by the author, five were sailors and six had travelled far. All came from the ports. At Singapore the Malays get neither tabes nor G.P., but the Chinese are attacked. Possible reasons for these differences are discussed. It is noted that myelitis, cerebral gumma, spastic paraplegia, are as common as in Europe, so that there is no question of a "dermotropic" virus.

The natives of Cochin-China are prone to convulsions, especially the children. A third of the deaths of infants are returned under this heading, and there is hardly a family which has not lost one infant from this complication, which may be due to nothing graver than constipation. This spasmophilia may be related to the deficiency of lime or to disturbance of function of the parathyroids.

As in Java hepatic cirrhosis is common, whereas gastric ulcer, gastric cancer, nephritis, amyloidosis, prostatic enlargement, rickets, appendicitis are rare. The Annamite peritoneum is remarkably resistant to infectious germs. Cheloid and vitiligo are common. The author concludes his paper with remarks on the psychology of the Annamites of Cochin-China.

A. G. B.

METCALFE (A. J.). **A General and Medical Survey of Thursday Island.**—*Health.* Melbourne. 1924. May. Vol. 2. No. 3. pp. 65–73. With 1 map in text.

Thursday Island is one of the smallest (2 square miles) of the large group forming the Torres Straits Islands. The hospital records show it to be one of the healthiest parts of Australia. It contains about 1,500 people, including 400 whites, 600 Japanese and 300 Papuans.

The industries are those of pearl shell, beche-de-mer and trochus shell; the trochus fly, which breeds in the decaying flesh of the trochus shell, is often a pest. Housing is unsatisfactory. Houses of galvanized iron are unsuitable and wood is subject to the ravages of borers and white ants. A new species of termite has lately been introduced which "can live quite isolated from the ground, and, apparently, can transport itself quite readily from one building to another." Most of the food consists of tinned or preserved stuffs; but goats are numerous. The water supply is good. The hospital returns, accurately kept since 1899, show that apart from beriberi there is little sickness of local origin. Dengue appears every year. Malaria does not arise in the island; few anopheles have been seen and breeding places are rare. The prevalent mosquitoes are *Aëdes aegypti* (*Stegomyia fasciata*) and *Culex quinquefasciatus* (*C. fatigans*). Yaws is common: gangosa and ulcerative granuloma are seen. Of typhoid and paratyphoid, 50 cases have been treated in the last 14 years; the means of infection must be flies and carriers. Thursday Island itself is free from hookworm, and is probably too dry to become infested, but the other islands and the mainland are heavily infected; the Papuan recruits for the pearling fishing are treated on arrival. The cemetery shows hundreds of victims of beriberi. Its prevention is difficult. The luggers, which are often at sea for months, must carry food that will keep, while each crew contains both Japanese and Papuans. Pulmonary tuberculosis has caused 46 deaths in 8 years; 2–4 per cent. of the permanent residents are affected. Factors of its causation are the housing, food and clothing of the wage-earners. Severe epidemics of dysentery have visited the island, such as the one described by BREINL in 1910. The influenza epidemic occurred in 1920, much later than in Southern Australia; 22 deaths were recorded. The island contains a small well-equipped quarantine station.

A. G. B.

SITSEN (A. E.). **Ueber den Einfluss der Rasse in der Pathologie.**—*Virchows Arch. f. Path. Anat. u. Physiol.* 1923. Vol. 245. pp. 281–294. [35 refs.]

Twelve years' residence in the Dutch East Indies have raised in the author doubts as to the correctness of current ideas of racial differences in pathology. Such differences can be usually explained otherwise To compare Europeans and Malays—Europeans are bigger, but this is probably the result of better food and other environmental conditions. The curves of the long bones in the legs are more pronounced in Malays; this is attributed to the squatting attitude, to which also the author would assign differences in the pelvis and vertebral column. It has been shown that the female Malayan pelvis is rounder than the European, and the author finds the same to be the case with the male. In Malays the small intestine is longer than in European, averaging 7½ metres; this is put down to the vegetable diet. Taking into acccount the differences in the size of the subjects, the Malay salivary glands should weigh 31–40 gm., but in 66 corpses examined the weight exceeded this upper limit; this also is attributed to the diet, which requires a large amount of saliva. MÜLLER has drawn attention to the small thyroid and narrow aorta of the Malay, but the author doubts whether these are race characters. The small cholesterin content of the blood of the Malay was believed to be a race character till Malays in Holland were found not to differ in this respect from Europeans and the defect to be dietetic.

On the pathological side the author draws attention to the frequency of liver cirrhosis: alcoholism is rare, tuberculosis can be exonerated; on the other hand, syphilis is frequent, and the author would attribute a significant rôle to malaria. JAFFE has shown that the injection of blood-destroying substances, including haemoglobin, into animals will produce cirrhosis. Croupous pneumonia also is considered. It is common among Malays; its course is atypical, and the mortality varies between 75 and 15 per cent. It is a form with little fibrin, which occurs in Europe in alcoholics, old people, little children and weaklings, and the author would explain it by the fact that, owing to their large ankylostome infestation, to chronic dysentery and malaria, the Malays are to be reckoned with the last class. Malaria he considers an important cause, owing to its destructive action on spleen tissue. Tuberculosis among the Malays is much more acute than in Europe. In Central Europe in the War the type changed, and became like that of Java, so that the author believes that this type is the result of ill-nutrition and diseases which weaken resistance. Arteriosclerosis, on the other hand, is infrequent in Malays. The cholesterin content of the blood, however, is small, and the blood pressure low, which would account for the rarity of sclerosed arteries. The rarity of appendicitis he puts down to the vegetable diet. Lastly, malignant tumours. The general opinion is that these are rare in the Dutch East Indies. But whereas in Europe carcinoma is the common form (324 in 381 in figures from Breslau), in the Dutch East Indies this disproportion does not hold. In 52 operations on Javanese there were 24 sarcomas and 28 carcinomas. The general mortality is so high that fewer of the Javanese reach the cancer age. SNYDERS found that the frequency of malignant disease in coolies at Deli was somewhat greater than among persons of the same age in Europe.

The upshot is that for supposed race differences enquiry will usually reveal another cause.

A. G. B.

GREGORY (J. W.). **Inter-Racial Problems and White Colonization in the Tropics.**—*Addresses delivered at the Meeting of the Brit. Assoc. for the Advancement of Science (94th Year) in Toronto: August* 6–13. 1924. Section E.—Geography. pp. 1–24. [3 refs.]

We are concerned only with the second part of this fascinating address, which deals mainly with the colonization of the Northern Territories of Australia. The supposed unfavourable factors in tropical life are discussed under the headings: moist heat, monotony in temperature, actinic rays. None is deterrent. It has been shown that men can withstand wet-bulb temperatures of 85°, though power of work is greatly reduced; the worst localities of Tropical Australia are compared by Dr. TAYLOR with Calcutta, "one of the healthiest cities in India, with a large and vigorous European population." Places with monotonously equable climates are in positions whence a change may be secured by a visit to some neighbouring hill country. Actinic rays are a bogey; they are favourable to life rather than nocuous. The remaining factors "rest on ill-defined nervous ailments which are more likely to be due to domestic difficulties than to climate."

Accounts are given of the improvement by public sanitation of such areas as Walcheren and Algeria, now health resorts, as well as the Spanish Main and Panama, and of old-established European settlements in the Tropics, such as the islands of Saba and Kisser, and Santa Katharina, where physical deterioration has not taken place. The favourable vital statistics of Queensland are cited, the low rejection-rate of recruits for the Citizen Army, the experience of the life assurance offices. The slow development of the Northern Territory is explained by the poverty of the soil, the annual drought lasting about six months, the absence of communication with the rest of Australia, and the last is remediable.

The history of the cane-sugar industry in Queensland is of particular interest. Some of these estates are in localities with " extreme tropical climates." In 1901 it was decided, in spite of widespread predictions of disaster, to prohibit South Sea Island labour. The result was, not collapse of the industry but increased prosperity. A table shows that in the last returns the acreage has increased by 50 per cent. and the output of sugar by nearly 100 per cent., though natural circumstances are not favourable. The author writes :—

> " The Australian adoption of white labour for its sugar plantations has been the greatest contribution yet made to the practical solution of the problem whether the white man can do agricultural work in the tropics. The experiment shows that white labour can be employed successfully in such an ultra-tropical industry as sugar cultivation in even the ultra-tropical climate of the Queensland coastlands, provided the settlers are protected from infectious disease and from the competition of people with lower standards of life," and concludes, " Australia will throw away a unique opportunity if it fails to make a patient effort to secure the whole continent as the home of the white race."

A. G. B.

NAUCK (Ernst Georg). **Die Kinderdosis der gebräuchlichsten Heilmittel in der Tropenmedizin.** [The Dosage for Children of the Remedies most frequently employed in Tropical Medicine.]—*Arch. f. Schiffs- u. Trop.-Hyg.* 1924. Aug. Vol. 28. No. 7. pp. 280-289. [3 refs.]

This is itself a summary. The remedies treated are vermifuges (chenopodium, thymol, santonin, carbon tetrachloride and others) ; antimony and its preparations ; emetine ; quinine ; neosalvarsan ; atoxyl ; chaulmoogra ; serum ; saline infusions. Much information is gathered, without generalization or criticism.

A. G. B.

CORY (George). **A Glance at the Medical History of the Cape Colony, particularly of the Eastern Province.**—*S. African Med. Rec.* 1924. May 10. Vol. 22. No. 9. pp. 192–197.

When Cape Colony came under British rule, in 1806, the men who professed the healing art appear to have been of a kind that to describe as " unqualified " would not be sufficiently derogatory. The first Governor General, however, instituted a sort of Medical Council, which purged and purified the profession by examinations and kept it in the strait path by heavy fines for unqualified practice. In 1821 a Colonial Medical Inspector was substituted for a Council, but in 1825 the Medical Council was re-established. The first hospital seems to have been started as a sort of private enterprise about 1833, at Grahamstown ; but it was not until 1857 that it became a general hospital in the ordinary sense, shortly after the Grey Hospital had been founded at Kingwilliamstown. Among the *dramatis personae* of this somewhat eccentric early stage were Dr. MACKRILL, who brought buchu to the notice of the profession ; the famous Dr. James BARRY—the army doctor who rose to be an Inspector-General of Hospitals and was discovered after death to be of the female sex ; and Dr. W. G. ATHERSTONE, whose hobby was geology, and who recognized the first diamond found at Kimberley as the real thing. Epidemics of what " have been called influenza and measles " have periodically devastated Cape Colony ; of the first, " about 1817," no records have been kept beyond that it swept away thousands ; the next, in 1839, broke out at Cape Town, where 6,655 cases and 51 deaths occurred, and then spread throughout the colony ; the next, in 1867, described as " measles," also made its appearance in Cape Town, where 5,000 cases occurred in seven months and 1,493 deaths within 36 weeks.

A. Alcock.

CAMERON (Thomas W. M.). **The Pig and Human Disease.**—*Proc. Roy. Soc. Med.* (Sect. Comparative Med.). 1924. July. Vol. 17. No. 9. pp. 31-37.

The author discusses, with due regard to the importance or otherwise of the particular practical outlook, the diseases common to the pig and man, including swine diseases that are communicable to man, and diseases and animal parasites that comprehend the pig and man in a wider community of specific hosts. He mentions and discusses tuberculosis, aphthous fever (foot-and-mouth disease), swinepox, swine-erysipelas, anthrax, rabies, and actinomycosis, as bacterial and fungus diseases possibly communicable from the pig ; *Bacillus enteritidis* Gaertner and *aertrycke* (the latter of which is probably identical with *Bacillus suipestifer*, the swine fever bacillus) and *Bacillus botulinus*, as bacterial diseases communicable by pork ; and the following list of animal parasites :—*Balantidium coli*, *Sarcoptes scabiei*, *Pulex irritans*, *Tunga* (*Sarcopsylla*) *penetrans*, the rat-tail larva of Eristalis, *Linguatula serrata* ; the flat-worms Paragonimus, *Fasciola hepatica*, *Clonorchis sinensis*, *Dicrocoelium dendriticum*, *Metagonimus ovatus*, *Schistosoma japonicum*, *Gastrodiscoides hominis*, *Fasciolopsis buski*, *Taenia solium*, and *Echinococcus granulosus* ; and the roundworms *Ascaris lumbricoides*, *Necator americanus* (?=*suillus*), (?) *Ancylostoma duodenale*, *Trichinella spiralis*, *Strongyloides stercoralis*, *Metastrongylus elongatus*, (?)*Mecistocirrus digitatus*, *Dioctophyme renale*, *Gnathostoma hispidum*, and *Echinorhynchus gigas*. Among other matters the author draws attention to the prevalent neglect of porcine pathology with its obvious bearings on the science of medicine.

A. A.

ARCHIVES OF MEDICAL HYDROLOGY. 1924. May. No. 5. pp. 149–155. With 1 fig.—**Discussion on the Treatment of Tropical Diseases by Waters and Baths.** (At a Special Meeting of the International Society of Medical Hydrology, held at the Royal Society of Medicine, London, on Wednesday, March 5th, 1924.) Opened by Dr. Robert PIERRET.

This discussion was opened by Dr. PIERRET (La Bourboule), who confined his remarks to the French Continental Spas. Of spas which possess " a specific antiparasitic action " coupled with a metabolic one, he states that La Bourboule is the only representative. Of metabolic spas he instances Vichy. The La Bourboule water contains 29 mgm.

of sodium arsenate per litre, " equivalent to about 31 drops of Fowler's solution." Here, in the war, 3,000 French soldiers were treated for malaria; the cure took 4–5 weeks; quinine was given, it appears, as well as the water. For " large tropical livers " Vichy is recommended.

Sir Leonard ROGERS pointed out that a " vast proportion " of cases of tropical hepatitis were secondary to amoebic disease of the bowel, though the signs of this might be slight or absent. No case of hepatic disorder of tropical origin should be treated by other means till emetine had been used and amoebiasis quite excluded.

The claims of Harrogate and of Cheltenham were supported by other speakers, and the President (Dr. Fortescue Fox) gave an account of the British records on the subject of the discussion.

A. G. B.

ACTON (Hugh W.) & CHOPRA (R. N.). **Some Factors in Individual Susceptibility.**—*Indian Med. Gaz.* 1924. June. Vol. 59. No. 6. pp. 278–289. With 11 graphs. [9 refs.]

The study of asthma and urticaria with the individual idiosyncrasies often associated with these diseases, and the observation of the widely-varying effects of certain bases extracted by a uniform process—of diseased rice upon different experimental animals of one and the same species, led the authors of this interesting paper to conceive of idiosyncrasy (as individually illustrated in asthma and hay-fever from animal and plant emanations, in urticaria and asthma from intestinal absorption, in anaphylaxis and serum-sickness from injection of foreign proteids, and in intolerance of certain drugs) as a physico-chemical business in which the " mechanism " (for they use the prevalent materialistic terminology) of *endocrine defence*, through the sympathetic nervous system, is intimately involved. This paper records their attempt to clarify this conception by experiment.

In their first set of experiments they studied the effects upon blood-pressure, heart, respiration, and (as severally necessary) limb and spleen and intestinal volume, of intravenous injections of tyramin, pilocarpin, and adrenalin under varied conditions of specific endocrine energy. They have registered the effects of these three bases on cats fed for a week on fairly large doses of thyroid and on cats deprived of their thyroid (without complete excision of the parathyroid); they have registered the effects of the first two of them, in the same way, under excessive administration of adrenalin and under deprivation of adrenalin (by the difficult operation of excision of the glands), and they have made limited observations of the tyramin and adrenalin response of the same animal before and after administration of commercial pituitrin. Limitation of space precludes the details of these experiments; it must be enough to say that they give support to the proposition that the intensity of the effects of a given base vary concurrently with the amount of the endocrine secretions present in the tissues.

In another series of experiments the authors studied the effects of tyramin, pilocarpin, and adrenalin on plain unconditioned cats, and found that among the individual reactions of the animals different types of curves for the several bases could be distinguished, which types, when compared with the corresponding curves of cats respectively dosed with and deprived of specific endocrine secretion, could be classed as indicating individual states of comparative insensibility and of comparative over-sensibility. [The argument is slightly ingenious.]

In the above experiments the effects of intravenous injections of the base are analysed and compared; but as regards susceptibility to drugs ingested by way of mouth, there has to be taken into account, besides endocrine defence, the effect exercised upon the permeability of the cell and upon the electrical conductivity of its surface by H-ion concentration and the effect of the activities of the liver.

The authors distinguished a "congenital," or natural, susceptibility, or idiosyncrasy, which they appear to regard as an individual lapse from a natural immunity inherent in a species, and an "acquired" susceptibility resulting from disuse of a long-accustomed food or drug, and manifested when, after an interval, that use is resumed. They make this distinction, and they record a third series of experiments showing the varying intensity of action of tyramin, pituitrin, and adrenalin in four different species of animals to illustrate what is termed "congenital" susceptibility; the details are interesting, but have merely a vague benedictory bearing on the particular argument of defensive mechanism.

The main purpose of the paper is to represent the phenomena of susceptibility as a series of complicated chemical interactions to be elucidated by experiment and by clinical evidence, to the ultimate understanding of such difficult diseases as scurvy, asthma, beriberi, etc.

In their practical conclusions the authors emphasize (1) an important *remote* action of adrenalin in diminishing capillary permeability, and therefore presumably useful in toxic oedemas and food asthma, as well as in urticaria; (2) the effect of thyroid secretion in increasing the vasculo-tensor but inhibiting the bronchio-relaxor action of adrenalin; and (3) the application of commercial pituitrin for stimulating torpid unstriped muscle. They also suggest a plausible explanation of quinine susceptibility as a result upon the circulatory system of the co-existence in the bloodstream of an excess of thyrotoxin, and a high concentration of unchanged quinine, the latter phenomenon being due to increased absorption from a too-alkaline bowel, deficiency of bile, and other defective functioning of the liver; and they think that susceptibility to certain "food diseases" may be similarly explained, with due regard to the contributory interaction of vitamines.

A. A.

McCarrison (Robert). **The Effects of the Excess-Ingestion of Certain Amino-Acids on the Growth, Metamorphosis and Thyroid Gland of Tadpoles.**—*Indian Jl. Med. Res.* 1924. Apr. Vol. 11. No. 4. pp. 1131–1136. With 2 plates. [1 ref.]

The amino-acids used were alanin, valin, leucin, tyrosin, tryptophan, and histidin. Fifty ten-day-old tadpoles of one batch were used for each test, all, as well as controls, being under the same ménage. The main results are as follows:—

Ingestion of amino-acids in amounts that had little or no influence on mortality rate tended to retard growth, tryptophan most so; but in the case of histidin retardation in the first weeks was balanced by enhanced growth in the last weeks. Histidin hastened metamorphosis; all others retarded it more or less, tryptophan most. All, except tryptophan (which caused an increase), caused a reduction in size of the thyroid as estimated per gramme of body-weight. All caused a reduction in number—out of proportion to the reduction in body-weight—of the thyroid vesicles; the vesicles were, in general, bigger in the case of tyrosin and tryptophan, smaller in the case of histidin. The thyroid contained, area for area, most colloid secretion in tryptophan-fed, least in histidin-fed animals. The effects of excessive ingestion of amino-acids on the histological structure of the thyroid were few and indefinite; tyrosin sometimes caused congestive and degenerative changes.

A. A.

i. LE ROY DES BARRES (A.). **Note sur le goitre au Tonkin.**—*Rev. Méd. et Hyg. Trop.* 1924. Apr. Vol. 16. No. 4. pp. 97–101.

ii. JEANSELME (M. E.). **Goitre, myxoedème et crétinisme en Indo-Chine et au Yunnan.**—*Ibid.* May-July. Vol. 16. No. 5. pp. 140–142.

i. Goitre is met with in the hilly part of Tonkin and exceptionally in the Delta. The higher one gets the more cases are found, and in certain narrow valleys at an elevation of 900 metres the proportion of cases is as much as 60 per cent. It is two and a half times commoner in females than males, and develops chiefly between the ages of 6 and 15. The natives incriminate certain springs, which, in some instances, at lower points, become harmless; these springs are usually rich in calcium and magnesium. Both parenchymatous and adenomatous forms are found. The symptoms are as a rule slight, and cretinism is unknown. Treatment by iodine has given good results here as elsewhere.

ii. Jeanselme refers to an article published in 1910 in which he described many cases from Indo-China in which myxoedema was associated with goitre. He cites some passages, from which it seems clear that cretins are by no means uncommon there.

A. G. B.

i. DOLBEY (Robert V.) & OMAR (Mustafa). **A Note concerning the Incidence of Goitre in Egypt. An Analysis of 216 Cases.**—*Lancet.* 1924. Sept. 13. pp. 549–550. [6 refs.]

ii. BALFOUR (Andrew). **Incidence of Goitre in Egypt.** [Correspondence.]—*Lancet.* 1924. Sept. 27. p. 677.

i. Simple parenchymatous or colloid goitre is extremely common in the Nile valley, but disorders of secretion resulting in hyperthyroidism and exophthalmic goitre or in myxoedema and cretinism are almost unknown. The authors have analysed 216 cases of thyroid enlargement admitted to Kasr-el-Ainy Hospital in the last five years. Of these 198 were colloid and adenomatous goitre, 9 malignant disease, 4 exophthalmic goitre, and 5 myxoedema or cretinism. Almost all these patients were fellaheen or manual workers of the cities, but it is noted that among wealthy Egyptians who live in the towns, and have adopted European habits, disorders of thyroid secretion are much more frequent. Thyroid enlargements have existed in Egypt since 2000 B.C., as may be seen in reliefs and wall paintings; cretins are never shown. Nowadays 18 women are affected to one man; the usual age of the women is 35, and nearly all have married young and borne children. The disease is not found among the Bedouin Arabs of the desert. As to possible causes, the villages on the Nile bank drink the river water, but the great majority of the rural population depend upon wells and irrigation channels which are "incredibly polluted"; it is among the latter that the thyroid enlargements occur. The iodine content of Nile water is slightly higher than that of London's water, and the salt used has also a higher iodine content than the table salt of Europe. Oral sepsis may be a contributing cause. The fellah's teeth are uncared for, and are commonly filthy, and it is at the age when the teeth become septic that goitre appears. The diet is almost wholly vegetarian and cannot be of influence. The conclusion is that the colloid goitre of Egypt is almost entirely due to the polluted water supply of the non-riparian villages, and the greatly lower incidence in the male may be due to his drinking from comparatively clean sources in the course of his work.

The absence of disorder of secretion of the thyroid among the fellaheen is attributed to their vegetarian vitamin-rich diet, the extreme rarity of nervous diseases among them, the complete absence of intestinal stasis and of suppressed emotions, the absence of financial worry, " the simple uncomplicated lives " led by them, the high infantile mortality which would wipe out cretins, and their endocrine balance ; all disorders of internal secretion, excepting diabetes, are rare. Similarly the development of disorders of thyroid secretion in the towns is attributable to the converse of these conditions. It is noted that the suprarenal capsule of the Egyptian is larger than in the Western European ; the average weight in 200 autopsies was 5 gm., against the European average of 3·5 gm.

ii. DOLBEY & OMAR say they have been informed that there is no goitre in Abyssinia. Dr. Balfour draws attention to a paper by Dr. Charles SINGER (*Jl. Trop. Med.* 1905, p. 17), who reports, with photographs, various forms of goitre as not infrequent in the south-west Abyssinian plateau.

A. G. B.

NICHOLSON (M. A.). **The Effect of Enteric Vaccine on Endemic Goitre in Children.**—*Indian Med. Gaz.* 1924. June. Vol. 59. No. 6. pp. 289–292. [2 refs.]

The children were those of the Royal Lawrence Military School founded for the children of British soldiers serving in India ; it is situated near Kasauli and accommodates 500. Goitre has long been prevalent, and especially so since 1899. The majority of the inmates were vaccinated against enteric in 1900, and again in 1913. It is concluded from the investigations, which have evidently been carefully conducted, that neither T.A.B. nor enteric vaccine had any effect, curative or prophylactic, on the endemic goitre prevalent at the school, and it is noted that endemic goitre is a condition peculiarly liable to spontaneous disappearance and reappearance. Half the cases of goitre disappeared spontaneously before the subjects left the school.

A. G. B.

ELDERS (C.). **De tegenwoordige opvattingen over Endemische Krop. Samenvattend overzicht.** [Epitome of the Present Views on Endemic Goitre.]—*Tijdschr. v. Vergelijkende Geneesk. enz.* Leyden. 1924. Apr. 26. Vol. 10. No. 2–3. pp. 120 127. [10 refs.] [English summary, p. 126.]

The English summary is as follows !—

" The newer knowledge of Endemic Goitre and the physiology and pathology of the thyroid gland is discussed, and seems to lead to the conclusion that the time has come for the government of the Dutch East-Indies to take in hand the prophylaxis of Endemic Goitre in the mountainous districts of Java and Sumatra."

A. G. B.

SNIJDERS (E. P.) & STRAUB (M.). **Contributions to the Cancer Problem in the Tropics.**—*Far Eastern Assoc. Trop. Med. Trans. Fifth Biennial Congress, Singapore, 1923.* pp. 779–804. With 11 figs.

This is quite the most valuable paper that has appeared on the subject of cancer in the tropics. The views of the authors may be guessed from the motto which stands at the head—" To see hidden things, we must search for them." They do not follow the facile doctrine so much in vogue now that malignant disease in primitive races is rare and is related to the mode of living : rather they hold that the available data are insufficient, that vital statistics of the native races are almost entirely lacking and the age-distribution unknown, that only a small proportion come under medical observation and post-mortems are rare. They suggest, therefore, that " internal cancers escape observation nearly totally," and note that recent investigations show that malignant tumours are not so unusual among primitive races as was supposed. They give a useful résumé of the published papers, unfortunately without references. They themselves are in a favourable position for collecting reliable statistics of the native labour force at Deli, Sumatra, for the hospital statistics cover many years, all sick coolies are sent to hospital, approximate age figures are available, and as a rule post-mortems are made. They report on 447 tumours examined at the pathological laboratory, Medan, between 1914 and 1923.

Chart II.—Proportion of Carcinoma, Sarcoma and other Tumours.

	Javanese.	Chinese.	European.	Others.	Unknown.	Total.
Carcinoma ..	101	75	20	25	4	225
Sarcoma ..	38	15	7	5	3	68
Other tumours	69	45	16	21	3	154
Total ..	208	135	43	51	10	447

A detailed table is given of the carcinomata, summarized thus :—

Chart IV.—Summary of Chart III. in Percentages.

	Stomach.	Oesoph.	Intest.	Liver.	Ovary	Uterus.	Mamma.	Skin.	Penis.
	Per cent.	Per cent.	Per cent.	Per cent.	Per cent.	Per cent.	Per cent.	Per cent.	Per cent.
Javanese. Male : female =2 : 1 ..	1	0	2	**55**	3	**16**	2	7	5
Chinese. Male : female =10 : 1 ..	**19**	4	3	**28**	1·2	0	2·8	9·3	10·1

There were 85 carcinomata of the liver, 79 of which concerned the liver cells, and this preponderance is the most striking feature. Taking the authors' own figures, of 887 post-mortems in 40 there was a malignant tumor, 30 of these were cancers and 13 primary cancers of the liver.

The symptoms follow two types : either the tumour, usually of the right lobe in rather young people, grows rapidly, is often painful, may cause fever and be diagnosed as abscess, or the process is that of a cirrhosis of the liver which becomes large and knotty. The primary liver cancers can be distinguished microscopically by the often close resemblance of a part of the tumour cells to the normal liver cells and of the structure of the new growth to that of the normal liver. Of the 79 carcinomatous livers referred to above, 67 were cirrhotic, and 7 were not; in 5, the data were insufficient. The authors see a close etiological connexion between cirrhosis and primary cancer of the liver. In their own material cancer occurred in one-fifth of the cirrhosis cases. Straub calculates that among the coolies cirrhosis is 5–10 times as frequent a cause of death as among a comparable age-group in Holland.

The authors tabulate the data from ten papers which concern Africa (6) or the far East, and show that of 438 cancers 171 were primary liver cancer. Among Javanese women cancer of the womb takes the first place. The conclusion is that "we must except the carcinoma hepato-cellulare at least from the assumed general rule of the rarity of cancer in the tropics."

For the rest of the paper the authors' summary must serve :—

"(1) Among the Javanese and Chinese in Deli (east coast of Sumatra) all kinds of tumours occur.

"(2) In Deli tumours are not at all rare. As to the malignant new growths, the number among our coolies (Javanese as well as Chinese) is not lower than among comparable groups in Europe. The sentence of R. Williams on Borneo, Java and Sumatra—a single example of a malignant tumour is 'esteemed a great rarity'—is certainly obsolete.

"(3) There are two kinds of apparent rarity : firstly, the tumours do not come under observation because of want of contact with the indigenous population; secondly, the age-incidence is not taken sufficiently into account (an orphan asylum is to be distinguished from an asylum for old people). . . . . .

"(4) The site-incidence of the tumours of our list is very remarkable in some respects and merits a thorough consideration.

"(5) The most striking feature is the high frequency of the primary cancer of the liver, among the Javanese as well as amongst the Chinese (in 90 per cent. of our cases in cirrhotic livers).

"(6) Cancers of the stomach do occur; although amongst the Chinese they take but a second place, and amongst the Javanese they seem to be rare. Ulcers of the stomach are very frequent amongst the Chinese, very rare among the Javanese.

"(7) Cancers of the buccal cavity are rare among the Javanese, perhaps rather frequent among the Singhalese.

"(8) Carcinomata of the intestines are rather rare, which is noteworthy when considering the high frequency of inflammatory affections of the intestines.

"(9) Penile cancers are rather frequent among our Javanese, probably also among Chinese and Singhalese.

"Carcinomata of the portio uteri are rather frequent amongst Javanese women. The age incidence of both is relatively low.

"(10) Melanotic new growths are rare.

"(11) Cystadenomata of the ovary are frequent among Javanese women, fibromyomata uteri rare.

"(12) 'Simple mixed tumours' are not seldom seen (orbita, salivary glands).

"(13) These conclusions agree very closely with those of other workers in the tropics, especially Daniels and Degorce (for Chinese and Annamites), and with regard to the primary cancer of the liver, also with the Japanese figures, and the recent figures from Africa concerning the negroes (Mouchet and Pol-Gerard, Appel, etc.).

"(14) So the great question, 'why in general malignant tumours are rare in the tropics,' is incorrectly put. It must run: 'Why is the *site-incidence* of the *malignant tumours* quite different from that in Europe?'

"To go deeper into the question for the present we must split up the cancer problem into separate definite problems for the separate organs, *e.g.*, why is primary cancer of the liver so *frequent* in many tropical countries as compared with Europe? Why is cancer of the buccal cavity so frequent in Travancore and Saigon, and probably much rarer in Tonkin and the Dutch Indies, though betel-chewing is common in all these countries? Why is mammary cancer rather rare in Japan and probably also among the Javanese?"

VAN DORT suggested that the frequency of buccal cancer in the Singhalese as compared with the Malayan races, may be due to their stronger betel "quid"; and that Aryans are comparatively free from primary carcinoma of the liver as compared with Mongolians and negroes. This would explain the relative freedom of Calcutta and Colombo.*

A. G. B.

BULLETIN DE L'OFFICE INTERNATIONAL D'HYGIÈNE PUBLIQUE. 1924. Feb. Vol. 16. No. 2. pp. 171–177. [9 refs.]—**Quelques indications sur le cancer dans les Colonies françaises d'après les réponses au Questionnaire sur les différences internationales dans la mortalité par cancer, envoyé conformément à la décision du Comité de l'Office International d'Hygiène publique dans sa session d'octobre 1922.**

Although this paper purports to be based on replies to a specific questionnaire it is merely an interim report, since many replies have still to come in and for lack of them recourse seems to have been made to old reports.

In French Somaliland cancer is said to be unknown. The same in Haute Volta, the only West African colony from which a return has been received. But according to LE DANTEC primary cancer of the liver is known to occur in Dakar, and surgeons in other places in West Africa have recorded cases of malignant tumour of other organs.

In Madagascar, where the survey is proceeding, malignant disease seems to be rare, though cancers of breast and womb have been verified, and some cases of cancer of rectum and stomach and parotid region have been diagnosed. In Réunion [no return] a summary of old records, some of them extending over 27 years, supplies about 150 cases of malignant disease, mainly of breast and womb, but also including tongue, stomach, intestine and liver.

In Pondicherry 27 cases of malignant tumour have been admitted to hospital in three years, of which 10 were uterine.

From Cochin China no returns have yet been received, but in Cholon of 2,025 admissions (in 1902–3), only 9 were diagnosed as cancer, in Choquan of 2,842 (in 1899–90), only 6, and in Cambodia and Laos in three years only 3 and 5 cases, respectively, were admitted as cancer. In Annam, however, malignant tumours seem to be not uncommon, since in ten years 348 cases were treated surgically; and the same in Tonkin, where in the course of seventeen years nearly 2,000 native cases have been admitted to the hospitals.

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* Attention is drawn to a curious misprint. "According to . . . . Harvey, *Pirie schistosomum* may play a part." Dr. Harvey PIRIE, whose paper was noticed in this *Bulletin*, Vol. 20, p. 213, found schistosomes in 10 out of 36 cases of liver carcinoma. It is to be hoped that this new "genus" will not make an appearance in the text-books.

From the Pacific islands no returns have been received; nor any from the West Indies, except Martinique, where 1 in every 15 of hospital deaths is attributed to malignant disease. In French Guiana neoplasms seem to be rare; one medical officer of 23 years' experience has seen 1 or 2 cases of cancer of breast or womb annually, but never a case elsewhere, except 3 cases of cancer of tongue, in all his time.

A. A.

MAXWELL (James L.). **Cancer among the Chinese.**—*China Med. Jl.* 1924. Apr. Vol. 38. No. 4. pp. 299–301.

The author, while allowing that little of precision is known about cancer in China, shows that that little is instructively paradoxical. Only one of its common Western forms, namely cancer of the cervix, appears to be equally common in China. The assumed age factor does not apply to China, since though the cancer rate is "very considerable" the expectation of life is "very low." The chronic irritation theory has one significant illustration in China—namely, the epithelioma of the trochanteric region, met with in the Kansu province, and attributed to the habit of sleeping on the hot *k'ang* or brick-stove-bedstead; this has a parallel in the *kangri*-burn cancer of Kashmir. But cancer of the breast and cancer of the stomach, so common in the West, are relatively infrequent in China, though chronic irritation of the nipple is the commonest of things, since children are frequently suckled until their milk-dentition is fairly complete; and in South China the stomach constantly suffers from overloading with rice, and gastric and duodenal ulceration are by no means rare. Nor is the buccal cancer of the East—attributed to the constant irritation of the familiar quid of betel—common in Formosa, where betel-chewing is customary with a large number of the population.

A. A.

MAXWELL (James L.). **Betel-Chewing and Cancer.** [Correspondence.] —*Brit. Med. Jl.* 1924. Apr. 19. p. 729.

In reference to the articles on this subject by SPITTEL and others (see this *Bulletin*, Vol. 21, p. 327), who show a definite association between buccal cancer and betel-chewing in Ceylon, the writer says that in nearly 20 years' experience of practice in South Formosa, where betel-chewing is common, buccal cancer was comparatively rare. Of malignant diseases cancer of the cervix comes easily first, followed by the breast, penis, alimentary tract and skin. He asks whether this is racial immunity, or is there some unknown factor in betel-chewing that is operative in India and elsewhere, but not in China? He refers also to the rarity of buccal cancer in betel-chewing Dutch East Indians (SNIJDERS).

A. G. B.

NEVE (Ernest F.). **Squamous Celled Epithelioma due to** *Kangri* **Burn.**—*Indian Med. Gaz.* 1924. July. Vol. 59. No. 7. pp. 341–344. With 5 text figs.

An account of Kangri-burn cancer by the same author was published recently in this *Bulletin* (*ante*, p. 326). It is, he thinks, due to simple heat, and he finds the temperature to which the skin is exposed to be between 150° and 200°F. Elderly Kashmiris have dry, scaly, usually pigmented patches not only on the irritated areas but also on extensor surfaces and on the back, and he suggests that heat irritation in one area may stimulate epithelial growth elsewhere. The growths usually start from the scars of previous burns. During the past 35 years, 45 operations have been performed annually at the Kashmir Mission for kangri-burn cancer, as compared with 10 for other forms of cancer. The technique of the operation is described. The disease is very amenable to operative treatment and distant metastases do not occur.

A. G. B.

TRABAUD. **Fièvre ondulante au cours d'une carcinose primitive du foie généralisée aux poumons.**—*Bull. et Mém. Soc. Méd. Hôpit. de Paris.* 1924. May 29. Year 40. 3rd Ser. No. 18. pp. 771–776. With 2 charts in text.

This is an extraordinary case of an Annamite sepoy, aged 28 years, admitted to hospital at Beirut, emaciated, with painful and extensive enlargement of the hepatic area, and a diagnosis of liver abscess. There was no history of dysentery and a course of emetine had no effect on either the condition or the temperature (which throughout the course of the illness was of remittent or intermittent type), and as also blood examination disclosed decided leucopenia with 8 per cent. of eosinophilia, the possibility of hydatid cyst was suspected. At an exploratory laparotomy, however, what was revealed was a much enlarged, non-adherent liver, with a superficial appearance of cirrhosis, but (on puncture) a lardaceous resistance, and some convolutions of a tumour showing on the under surface. The possibility of syphilis was then suggested, notwithstanding a negative WR, and an intravenous course of neosalvarsan was given, but without any effect. Emaciation, cachexia, and abdominal distension increased until, after a week of frequent attacks of abundant epistaxis, the patient expired, on the 86th day.

At autopsy the enormously enlarged liver weighed more than 15,000 gm. and the right lobe was occupied by an encapsuled tumour as big as a large foetal head with an appearance and consistence resembling brain ; 9 or 10 tumours of similar structure, and varying in size from a hazel-nut to a small apple, were found elsewhere in the liver, and many similar metastases, ranging in size from a grain of millet to a hazel nut, were present in the lungs but not in any other organ. Microscopic examination showed this tumour tissue to be extensively necrosed, but the less degenerate foci consisted of coils and strands of large polygonal cells—often monstrous and multinuclear—ramifying in a vascular meshwork. The author sums up the process as originally a typical trabecular adenoma, gradually spreading throughout the liver by way of the lymphatic channels, and then showered into the lungs as a " miliary carcinosis " by way of the bloodstream. The fever is attributed to toxic resorption of products of the extensive degeneration of the tissues.

A. A.

JEWELL (N. P.). **Malignant Disease in the Negro Races.**—*Kenya Med. Jl.* 1924. June. Vol. 1. No. 3. p. 88.

Fewer cases of malignant disease are met with in natives in East Africa than in Europeans (1) because fewer natives of cancer age are seen ; the old people go back to the reserves ; (2) internal cancer is likely to be missed in dispensary work. Cancer of the cervix uteri might be found more often if vaginal examination were employed.

A. G. B.

CLEARKIN (P. A.). **Malignant Disease in Africans.** [Correspondence.] —*Kenya Med. Jl.* 1924. Aug. Vol. 1. No. 5. pp. 154–156.

In the years 1914–21 only two instances of malignant disease were recorded at the Nairobi Laboratory. In 1922–4 there were 14 such (5 carcinoma, 9 sarcoma). The large increase corresponds with the increase in the number of doctors working in the native reserves. The writer doubts whether cancer is much less frequent among Africans than among Europeans.

A. G. B.

MILLER (F. R. Lanfear). **A Case of Breast Carcinoma in an African.**—*Kenya Med. Jl.* 1924. May. Vol. 1. No. 2. p. 51.

A Nyangori female aged about 50 whose ulcerated breast was removed at Kisumu. Pectoralis major and infra-clavicular and axillary glands were implicated.

A. G. B.

ADAM. **Cancer de l'ovaire.**—*Bull. Soc. Path. Exot.* 1924. Apr. 9. Vol. 17. No. 4. pp. 330–333.

A large abdominal swelling in an African woman of 35 at Dakar proved to be due to inoperable cancer of the ovary, revealed at the operation and more closely examined after death.

A. G. B.

RAZETTI (L.). **El cancer en el Hospital Vargas.**—*Gac. Med. de Caracas.* 1924. Jan. 15. Vol. 31. No. 1. pp. 1–4.

In Venezuela during the years 1908 to 1912 inclusive there were 1,820 deaths from cancer, an average of 364 per annum, or 0·15 per thousand inhabitants. At the Vargas Hospital, between Jan. 1st, 1921, and Dec. 31st, 1923, there were 141 patients suffering from this disease, of whom 60 were males and 81 females. Of 53 who were operated upon 9 died—two each of cancer of the liver, the colon, the breast, the uterus, and one of the tongue—while 44 left hospital apparently free from the disease.

H. Harold Scott.

DE BOER (H. S.). **Some Notes on the Aetiology of Malignant Pustule in Kenya.**—*Kenya Med. Jl.* 1924. June. Vol. 1. No. 3. pp. 81–85.

Between March 27th and May 18th, 21 patients, all but one males, were admitted to hospital at Nairobi with cutaneous anthrax lesions. A table gives the position of the lesions, single in 12 cases, two or more in 8, and the history of infection. The author asks whether the infection is local through the skin, or the skin lesions part of a general infection. None showed any lesion of the internal organs and all recovered. No cultures were attempted from the blood. The author inclines to cutaneous infection but postulates a break in the skin surface. Five patients from one farm had lesions on or about the left shoulder, and it is suggested that they were carrying infected carcases. Dr. CALLANAN, who reported 40 cases, found the lesions of half of them on the left shoulder, arm, or breast, which are bare when, as is the rule, the blanket is fixed over the right shoulder. He believes infection to be carried by a Haematopota.

A. G. B.

PROCTER (R. A. W.); CALLANAN (J. C.). **Etiology of Anthrax.** [Correspoondence.]—*Kenya Med. Jl.* 1924. Aug. Vol. 1. No. 5. pp. 156–157.

Dr. Callanan considers that *Haematopota vittata* is a factor in the spread of anthrax among natives in his district, either from infection of the proboscis or by causing a slight abrasion through which the virus enters independently, as by the carrying of infected meat over the shoulder.

Dr. Procter's district, to the north, is free from Haematopota and he has seen 24 cases of anthrax among Somalis, men, women and children all actually engaged in herding cattle. The majority of the lesions were not situated on exposed parts. He thinks that anthrax is more probably spread by direct contact or by the agency of infected clothing; if by flies, other members of the tribe should have been infected. A. G. B.

MAES (E.). **Un cas de charbon externe soigné uniquement par le novarsénobenzol en injection intra-veineuse. Guérison.**—*Rev. Méd. et Hyg. Trop.* 1924. Apr. Vol. 16. No. 4. pp. 115–117. With 1 chart.

A native of the French Soudan presented on the right cheek and forehead three pustules with deep oedema of the skin and right cervical adenitis; the lesions were three days old. Examination of the fluid from a pustule discovered anthrax bacilli. The next day the swelling had increased and the malignant pustule was typical—a central slough surrounded by a ring of vesicles. An intravenous injection of 0·3 gm. novarsenobenzol was given. Improvement was noted two days later, and after another two, the oedema and adenitis had vanished, the pustules were cicatrizing, and no bacilli could be found. The native considered himself cured and disappeared.

A. G. B.

PICCININNI (F.) & SCAGLIONE (G.). **Ricerche di patologia sperimentale sull' efficacia della proteino-terapia aspecifica nelle infezioni da carbonchio, peste e tifo.** [Aspecific Protein Therapy in Anthrax, Plague and Typhoid.]—*Riforma Med.* 1924. May 19. Vol. 40. No. 20. pp. 459–461. [27 refs.]

This is purely laboratory work and experiments on guineapigs. The aspecific proteins chosen for therapeutic use were milk and horse serum (pure, or containing diphtheritic anti-toxin). [The results are open to criticism, and we do not intend to discuss this work in detail. In any case we do not see much to encourage this treatment for human beings, especially when we possess more valuable therapeutic agents for plague and typhoid.]

J. H. Tull Walsh.

TRESTON (M. L.); BALFOUR (Andrew). **A Case for Diagnosis.**—*Jl. Trop. Med. & Hyg.* 1924. Apr. 1 & May 1. Vol. 27. Nos. 7 & 9. pp. 75; 108.

A Mussulman muleteer in Burma admitted to hospital with fever and loss of power in the lower extremities died 48 hours later. Anthrax bacilli were found in the cerebrospinal fluid.

Dr. Balfour gives four references to similar published cases.

A. G. B.

PRESTI-SEMINERIO (F. Lo). **Cinque casi d'infezione associata malaria-melitense.**—*Policlinico.* Sez. Prat. 1924. Aug. 11. Vol. 31. No. 32. pp. 1036–1038. [7 refs.]

The author, after referring to previous records of the association of undulant fever with typhoid and paratyphoid B, and with kala azar, briefly relates five cases in which the same disease was found in association with malaria, three with benign tertian and two with quartan. In one instance protein- and vaccine-therapy were employed, but in the others administration of quinine only is recorded. The undulant fever was diagnosed by agglutination, the titre being 1 : 200 in four instances, 1 : 500 in the fifth. [What effect the malaria had on the course and character of the other disease is not stated.]

H. Harold Scott.

DOCK (William). **Intermittent Fever of Seven Months' Duration due to Meningococcemia (with an Analysis of Sixty-Eight reported Cases of Meningococcemia).**—*Jl. Amer. Med. Assoc.* 1924. July 5. Vol. 83. No. 1. pp. 31–33. [6 refs.]

This case was one of those which simulate malaria. The patient for long periods had fever every third and occasionally every fourth day. Other symptoms were a recurrent rash, headache and joint pains. Sixty eight cases of meningococcaemia have been reported. In 49 fever was intermittent daily, two-day cycles occurred repeatedly in 37, three-day cycles in 21, and four-day cycles occasionally in 3. Only 4 of the tertian or quartan recurrences were unmixed with quotidian. The meninococci may be isolated from the blood in ascitic broth. Such infections should be treated intensively with polyvalent antimeningococcus serum.

A. G. B.

PIGA. **La radioexcitación en las enfermedades infecciosas y parasitarias.**—*Siglo Méd.* 1924. July 26. Year 71. Vol. 74. No. 3685. pp. 87–89. [1 ref.]

This paper was read before the Academy of Medicine at Madrid. The author states that the use of X-rays in one-third or less of the dose sufficient to cause cutaneous erythema has proved very effective in malaria, tuberculosis and typhoid fever. The types of malaria most benefited are, in that order, subtertian, benign tertian, quartan and chronic. No precise details as to the method of employment are given.

H. Harold Scott.

AMAYA (Carlos A.). **Fiebre recurrente y paludismo agudo. Necesidad de un diagnóstico rápido.**—*Repert. Med. y Cirug.* Bogotá. 1924. June. Vol. 15. No. 9. (No. 177.) pp. 449–458.

Six cases are recorded presenting similar symptoms of high fever with rigor, and, in some, vomiting and convulsions. Treatment with quinine being ineffectual in three of the patients the blood was examined and the spirochaete of relapsing fever found. Injection of 10 cgm. of neosalvarsan brought about a cure. The cases are reported in order to point out the necessity for early blood examination in such conditions and to warn against the prevailing custom of regarding them all as malarial.

H. Harold Scott.

WAMPLER (F. J.). **Osteomalacia in China.**—*China Med. Jl.* 1924. May. Vol. 38. No. 5. pp. 349–357. [8 refs.]

Osteomalacia is very prevalent in central Shansi. Six villages and two suburbs of Ping Ting Chow were thoroughly canvassed. Of 3,536 women and girls of the suburbs 35 were affected, and many light cases were found not to have been reported. The author estimates that among the adult women in the suburbs the incidence is 1 in 45, and in the farming villages 1 in 173. The disease is more prevalent among the upper and middle classes than among the poor. It attacks women who get little exercise and little sunshine. It is described as a " lazy women's disease." The author has studied 46 cases.

" Among some of the outstanding features of this careful study it was found that more than 75 per cent. of patients with osteomalacia had tetany ; 28 per cent. had a positive Chvostec ; in 31 per cent. the disease began during pregnancy, and in 39 per cent. during the nursing period ; one-third of the cases reported oedema over the affected parts ; 80 per cent. of the patients were worse in winter and spring ; in 39 per cent. the teeth were painful and loose. The dental symptoms disappear when the general osseous condition improves. . . . Out of a total of 130 children born to osteomalacic mothers, only 54 are living. In five cases the disease commenced before menstruation began ; in one case six years before, and in another four years. . . . Four patients are entirely well. Three of them got well after Caesarian section. In no case was oöphorectomy or tying off the tubes performed. In one case the cure was spontaneous. In the first general survey we have records of at least eight other spontaneous cures."

In several families there were two or more cases. Details are given of the diet. It is described as very deficient in calories and very poorly balanced from the chemical as well as the vitamin standpoints. The aetiology is discussed at some length and reference is made to the paper by HUTCHINSON and PATEL [this *Bulletin*, Vol. 18, p. 298], who opined that lack of fresh air and exercise was by far the most potent factor of causation in Bombay. The author would assign the disease to a fault of diet. The frequent occurrence of tetany suggests a lack of calcium. He has had good results with treatment by cod-liver oil and calcium lactate or phosphate ; no patient taking this treatment failed to report progress after two months.

A. G. B.

LANDON (E.). **Osteomalacia and Sprue.** [Correspondence.]—*Jl. Assoc. Med. Women in India.* 1924. May. Vol. 12. No. 2. pp. 37–38.

On the assumption that osteomalacia is directly due to some defect in calcium metabolism, the suggestion is made that the condition might be treated successfully by the method introduced by SCOTT for the treatment of sprue.

A. A.

MORTIAUX (C.). **Intoxication par les Graines de Ricin.**—*Ann. Soc. Belge de Méd. Trop.* Brussels. 1924. Jan. Vol. 3, No. 3. pp. 239–240.

Seven persons who had eaten a varying number (5–18) of castor oil seeds were taken with intractable vomiting and choleriform diarrhoea. For two days they could not keep even water down. Recovery was rapid except in the case in which 18 seeds had been taken. This patient died ten days later after some days' heart weakness with cyanosis and loss of power in the limbs. The ricin of the seed is believed to have an action on the heart and motor nerve terminations. The seeds or oil cake are known to be very poisonous; according to RICHAUD three or four seeds are enough to kill a child.

A. G. B.

SWARUP (Anand). **Poisonous Wheat.**—*Indian Med. Gaz.* 1924. Apr. Vol. 59. No. 4. pp. 186–187.

An account of a train of symptoms in two families suggesting poisoning, and following the ingestion of flour recently obtained from the bazaar. A sample was to be sent to the School of Tropical Medicine, Calcutta. The chief symptoms were vomiting, giddiness and tremors (*cf.* this *Bulletin*, Vol. 20, p. 676).

A. G. B.

PHELPS (B. M.) & HU (C. H.). **Carbon Tetrachlorid Poisoning: Report of Two Fatal Cases and a Series of Animal Experiments.**—*Jl. Amer. Med. Assoc.* 1924. Apr. 19. Vol. 82. No. 16. pp. 1254–1256. [6 refs.]

In two fatal cases of carbon tetrachloride poisoning, in persons of 5 and 46 years, the chief finding was central necrosis of the liver. In one case the suprarenal glands showed necrosis of the cortical cells; in the first the glands were not preserved. The drug caused central necrosis of the liver and necrosis of the suprarenal cortex in guinea-pigs. Regeneration of liver cells in these animals after central necrosis is very rapid; after 40 hours evidence of regeneration is prominent; after 8 days it is complete. The symptoms following ingestion of the drug in human cases are probably associated with the presence of central necrosis of the liver, and the absence of this lesion in reported cases is probably due to rapid regeneration of the liver cells. It is pointed out that similar lesions of these two viscera are characteristic of poisoning by the allied substance, chloroform.

A. G. B.

HÖPPLI (R.) & KESSLER (A.). **Zur Frage der Giftigkeit von Tetrachlorkohlenstoff.** [The Toxicity of Carbon Tetrachloride.]—*Arch. f. Schiffs- u. Trop.-Hyg.* 1924. May. Vol. 28. No. 5. pp. 205–210. [3 refs.]

Four dogs of 7 weeks treated for worms with unpurified carbon tetrachloride and with oil of chenopodium, a single dose of each, died a few days later. The livers showed cell necrosis at the centre of the acini, and in 3 instances degeneration of the renal epithelium [*cf.* MEYER and PESSOA, this *Bulletin*, Vol. 20, p. 257]. There was no reason to think that the oil of chenopodium caused death or these changes. A dog treated with pure carbon tetrachloride, 5 doses of 3·3 cc., 16·5 cc. in all, did not develop symptoms; it was killed, and similar changes were found in liver and kidneys, which seemed to show that these lesions were not due to impurities. Another dog which received carbon bisulphide showed diffuse degeneration of liver cells and not central necrotic foci. Kessler, the chemist, says that the unpurified samples contained carbon bisulphide, and he gives the chemical tests for this substance and for benzol and phosgene, other possible impurities.

A. G. B.

DALE (H. H.). **The Purity of Carbon Tetrachloride.** [Correspondence.] —*Brit. Med. Jl.* 1924. July 26. p. 160.

LAMSON and others (*ante*, p. 411) have shown that large doses of carbon tetrachloride may be given with impunity to dogs, as it is practically not absorbed from the alimentary canal, but that in the presence of fat or alochol there is danger of absorption and poisoning. Dr. Charles TODD, of Cairo, finds that bad symptoms are traceable to an impurity which proves to be carbon bisulphide. All therefore who order carbon tetrachloride for internal administration are advised to stipulate that it shall be *free from sulphur*, and to test each consignment. A simple test is the copper xanthate test described in the B.P. Codex.

A. G. B.

v. LIEBENSTEIN. **Ein Fall von Vergiftung mit Oleum Chenopodii.** [A Case of Chenopodium Poisoning.]—*Med. Klin.* 1924. May 11. Vol. 20. No. 19. pp. 642 643.

An ill-nourished and anaemic woman of 28 had taken in mistake for castor oil 4 capsules of "Chenoposan," corresponding to 2 gm. oil of chenopodium. Fifteen minutes later there was burning of the hands and nausea, followed by faintness; after 2 hours dimness of vision was complained of; after 10 hours the sight was normal but deafness was almost complete, with much tinnitus. Later the respiration was irregular, the pulse infrequent and of low tension. Noises in the ears and deafness persisted for 6 weeks and had not quite disappeared after 5 months. Another well-nourished patient took the same dose without any untoward symptoms. The author refers to ROTH's paper (see this *Bulletin*, Vol. 20, p. 258).

A. G. B.

CHOPRA (R. N.) in collaboration with GHOSH (B. N.) & DE (Premanker). **Some Observations on the Toxicity of Emetine.**—*Indian Med. Gaz.* 1924. July. Vol. 59. No. 7. pp. 338–341. [6 refs.]

By a series of experiments on rabbits in which 1 mgm. for each kilo body weight was injected intramuscularly the authors showed that emetine is a general protoplasmic poison having a selective action on the cells of certain organs; that the parenchyma of the heart muscle is affected early, the changes being cloudy swelling, then shrinking, and finally atrophy of the muscle fibres; that the drug acts on the endothelium of the capillaries, producing petechiae at the site of injection; and that liver and kidneys are affected later. At the Carmichael Hospital, Calcutta, the practice is to give a saline purgative followed by 6 injections of one grain of emetine hydrochloride combined with 2 to 3 drachms of bismuth subnitrate or carbonate by the mouth, three times a day. Three days' rest is succeeded by 3 more injections. The bismuth salts alter the acidity of the gut contents, probably by fixing the free acids, and emetine has been shown to act best in an alkaline medium (this *Bulletin*, Vol. 20, pp. 781–2). The association with bismuth reduces the number of emetine injections required.

A. G. B.

ARKWRIGHT (J. A.). **The Position of Rickettsia as an Aetiological Factor in Disease.**—*Jl. Roy. Army Med. Corps.* 1924. June. Vol. 42. No. 6. pp. 447–452. [8 refs.]

In this paper the proposition that each Rickettsia disease is associated exclusively with a particular virus and a distinguishable kind of Rickettsia body is separated from the proposition that Rickettsia bodies are living organisms, though both propositions are equally upheld.

As regards the first proposition, well-established facts in the history of Rocky Mountain Fever and *Dermocentroxenus rickettsii* and of Typhus and *Rickettsia prowazeki*, upon which it is based, are recounted, along with a brief dissenting notice of the theory that *Rickettsia prowazeki* is the form assumed by *Bacillus proteus X* in the louse.

In dealing with the second proposition attention is concentrated on WOODCOCK's theory of haemetaboly (see this *Bulletin*, Vol. 19, p. 620), according to which Rickettsia bodies in general are merely organic detritus (chiefly of red blood corpuscles and nuclei of cells) and the Rickettsia bodies found in lice infested with typhus and trench fever are not different from those found in normal lice.

Although several workers claim to have cultivated the Rickettsia of infected lice on special media, the author admits that these bodies " cannot with any certainty be cultivated in artificial media," and therefore that their position in the cosmos must, for the present, be judged from their appearance in stained films and sections. As concerns *R. prowazeki* and *R. quintana* (the body associated with trench fever) believers in the theory that they are specific micro-organisms distinguish them by their " different range of morphology in the two diseases " and by the fact that in the louse the former is found inside the cells of the gut, and the latter in the lumen of the gut. WOODCOCK does not entirely deny that such differences of size and location can be verified, but he assigns them to the action of two viruses which have different effects upon the digestive processes and products of the louse. For the present, the author appears to be content with the acknowledgment of two distinct viruses, each associated with a distinct type of Rickettsia recognizable in films preserved in the Lister Institute collections. While admitting that the matter is still in question, he inclines to the opinion that Rickettsia is a micro-organism, and he thinks that this opinion is strengthened by the fact that specific agglutinins have been obtained from lice (or ticks), infected severally with typhus, Rocky Mountain fever, and trench fever, whereas LEDINGHAM was unable to cause the appearance of antibodies from normal lice.

A. A.

WOODCOCK (H. M.). **Ferment-Viruses and Pathological Haemetaboly.** [Correspondence.]—*Jl. Roy. Army Med. Corps.* 1924. June. Vol. 42. No. 6. pp. 469–470.

Woodcock sees in an opinion expressed in a paper by DOERR and ZDANSKY (*Zeitschr. Hyg.* 1924, p. 102) touching the cause of encephalitis lethargica, that the conception of a living microbial virus as a necessary cause of a contagious disease is too absolute, a corroboration of his theory (see this *Bulletin*, Vol. 19, p. 620, and Vol. 20, pp. 676, 677) that a virus may be an inanimate entity—ferment, cytotoxin—produced during the destructive action of a micro-organism on tissue-cells but transmissible independently of the micro-organism. The invisible cytotoxin—an " ultramicroscopic " virus—and the visible microscopic detritus of the cells (or, rather their nuclei) are co-existent for the time being, and thus on Woodcock's theory the pathological significance of Rickettsia bodies is to be explained. Further, regarding the alleged cultivation of Rickettsia bodies by WOOLBACH and SCHLESINGER (*ante*, p. 664), Woodcock takes this opportunity of asking how, if, as is stated, Rickettsia bodies were found only in cells of the culture, never in the plasma, and the Rickettsia-infected cells of the culture died—How in such circumstances did the Rickettsia bodies, unable to pass from cell to cell, manage to maintain and reproduce themselves; or, alternatively, how could infected and dying cells thrive and multiply?

A. A.

CASTELLANI (Aldo). **Medical Mycology.**—*Jl. Trop. Med. & Hyg.* 1924. Mar. 1. & 15. Vol. 27. Nos. 5 & 6. pp. 49–53; 61–65.

These are the first two instalments of an amplification of a paper read at the 1923 Meeting of the British Medical Association. After commenting on the little attention now given to the higher fungi by pathologists and emphasizing the facts that the higher fungi were recognised in pathology (in 1839) long before anything was definitely known about bacteria, and that they now have an important status in tropical medicine, the author commences with a classification of the fungi and proceeds to illustrate in some detail his mycological method for the identification of sugars and other carbon compounds. This method, it is incidentally mentioned, is also of practical use in the analysis of urine, especially in the detection of glucose, laevulose, maltose, galactose, lactose, and pentoses. He then starts upon the higher fungi as pathogenic agents in man, and proposes a limitation of the subject to thrush, bronchomycoses, tonsillomycoses, and certain external mycoses. Beginning with thrush, he catalogues 17 species, included in 6 genera, which he regards as causative of the disease, and describes briefly the discrimination of each by its fermentive characters towards sugar.

A. A.

DELAMARE (G.), DJÉMIL (Saïd) & ARCHITOUV. **Spirochétose caecale, scorbut expérimental et mélaena.**—*Bull. Acad. Méd.* 1924. Apr. 8. Year 88. 3rd Ser. Vol. 91. No. 15. pp. 462–463. With 1 text fig. [1 ref.]

In favour of a relation between certain dietetic deficiencies and proliferation of intestinal spirochaetes the authors cite (1) the relatively large number of cases of intestinal spirochaetosis observed at the close of the war, when great numbers of people were underfed; (2) their frequency in chronic amoebiasis in which nutrition is often defective; (3) the fact that prescorbutic changes in the gums seem to offer a favourable field for Vincent's symbiosis. However, in 400 Anatolian refugees suffering from symptoms attributable to avitaminosis the authors could find no trace of intestinal spirochaetosis. In two instances out of fifteen, caecal spirochaetosis was found in scorbutic guineapigs in which haemorrhages had taken place in the caecum, but it is considered that the spirochaetes were saprophytic. It is concluded that in addition to cases in which melaena appears as a probable consequence of spirochaetosis there are those in which the spirochaetosis is secondary to the haemorrhage, and the like distinction is to be made between bronchospirochaetosis (Castellani) and secondary spirochaetosis developing in blood of haemoptysic origin; such spirochaetosis does not give rise to lesions or physical signs and does not require treatment.

A. G. B.

MATTLET (G.). **Recherches au sujet de deux races de bacille pyocyanique.**—*Ann. Soc. Belge de Méd. Trop.* Brussels, 1924. Jan. Vol. 3. No. 3. pp. 337–345.

The strains of *B. pyocyaneus* were isolated from abscesses and fistulae in natives of Urundi, Belgian East Africa. It was noted that the abscesses had little tendency to penetrate the skin. Two races were identified with the E and S strains of GESSARD differing in their action on sugars and in the production of sulphuretted hydrogen. Full details are given of the cultural characters, biochemical properties, action on sugars, and proteolytic action.

A. G. B.

VAN DEN BRANDEN (F.) & VAN HOOF (L.). **Observations cliniques.**—*Ann. Soc. Belge de Méd. Trop.* Brussels. 1924. Jan. Vol. 3. No. 3. pp. 325–326. [3 refs.]

1. A negro child aged 10 with spina ventosa and yaws lesions on the soles. A radiogram of the upper limb revealed lesions of osteitis and periostitis in the phalanx of the middle finger and in the lower third of the ulna. Recovery was complete after sulfarsenol and novarsenobenzol treatment.

2. A case of club foot in a young negress.

3. A case of herpes zoster in a negress, a rare affection at Stanley Pool. There was a strong Bordet-Wassermann reaction, and the lesions disappeared after arsenical treatment.

4. A case of lichen in a young negro. Syphilis and yaws and mycosis were excluded. The affection disappeared spontaneously after three months.

A. G. B.

VAN NITSEN (R.). **Le rôle de l'association fuso-spirillaire dans la pathogénie de certaines affections tropicales.**—*Ann. Soc. Belge de Méd. Trop.* Brussels. 1924. Jan. Vol. 3. No. 3. pp. 317–324. [8 refs.]

Vincent's spirochaete and the fusiform bacillus are saprophytes in the mouth and alimentary canal. They are found in 50 per cent. of smears from the pharynx and in about 20 per cent. of stools of healthy natives. Their presence is the rule in certain affections of the skin, mouth, pharynx, respiratory passages and digestive tube. To give details, they are found almost constantly in phagedenic or tropical ulcer and prexisting lesions which they invade are—infected burns of the arms and legs; eczematous ulcers of the feet; ulcerations of the feet the result of chigger invasion; ulcerative lesions of tertiary yaws. Hence the phagedenic character, which may lead to extensive necrosis of bone. Such conditions in the mouth are, mercurial gingivitis, scorbutic gingivitis, erosion and perforation of the palate, dental abscesses, simple angina, membranous angina, extensive ulceration of the face (see this *Bulletin*, *ante*, p. 9). As to the respiratory tract, examination of sputa at Panda in 1922 revealed this association in 87 out of 169 bronchitics and 66 out of 137 pneumonia cases, *i.e.*, 50 per cent. in all. Figures are given for the digestive tube, in diarrhoea, dysentery and typhoid.

The author asks, what is the relation between these various affections in which this association of organisms is found? There seems no doubt that as regards hospital gangrene, noma, ulcero-membranous angina, tropical ulcer, and Castellani's bronchitis the association is the one described by VINCENT.

The origin of the organisms in the intestine is more obscure. The obvious suggestion that they come from the mouth is supported by the report of BOUCHET and LEROUX of intestinal symptoms consecutive to Vincent's angina. Moreover, the authors found the organisms in the stools in 50 per cent. of bronchitis cases and 49 per cent. of phagedenic ulcer cases, whereas the proportion in the stools of healthy natives was but 20 per cent. Soiled fingers would carry them from ulcer to mouth. They have never been found in blood or urine.

Whereas these organisms are few in the digestive tract and respiratory ways of healthy natives, in pathological states they multiply rapidly. They may increase to such a point as to form inextricable bundles of spirochaetes and bacilli. The chief causes of this multiplication are, according to the author, association with other microbes and influence of terrain. Studying the organisms found in tropical ulcer the author was struck by the fact that in all serious cases, in full development and frankly phagedenic, there were found diplococci as well as spirochaetes and fusiform bacilli, and he suggests that the presence of the diplococci enables the association to get a footing and grow. In affections of the mouth and respiratory channels there are other organisms present, and it has been observed that certain forms of dysentery are more favourable than others. Thus, DE LAVERGNE found the association in 76 per cent. of his amoebiasis cases but was unable to discover it in 7 bacillary cases (this *Bulletin*, Vol. 19, p. 705). The author was successful in 17 per cent. of 69 cases of bacillary dysentery, but 20 per cent. is the proportion for normal stools, and in the amoebic cases the organisms were found in much greater numbers. Other intestinal parasites seem to favour the association; such are lamblia, trichomonas, ancylostomes, ascaris, taenia, *Schistosoma mansoni* and typhoid fever.

As to the influence of terrain Vincent's spirochaete cannot establish itself in healthy skin or aseptic wounds, but if the integuments are crushed or injured by caustic potash a phagedenic ulcer will develop. The vitality of the tissues must be impaired. This accounts for the conditions of the mouth, respiratory ways, and intestine mentioned already in which the symbiosis flourishes. The worse the general condition the greater the receptiveness to the symbiosis. Tropical ulcer is a disease of the poor and the poorly nourished.

Two cases are cited of phagedenic ulceration of the face due to this association starting in dental caries and developing in very debilitated subjects. These were neither noma, gangosa, syphilis, leishmaniasis, nor blastomycosis.

A. G. B.

IRVINE (A. C.). **Pyorrhoea in Natives.**—*Kenya Med. Jl.* 1924. June. Vol. 1. No. 3. p. 87.

Amongst Mwimbi natives (East Kenya) presenting themselves at hospital 70 per cent. had definite pyorrhoea with bleeding spongy retracted gums and pus formation; and the same was the proportion in men presenting themselves for work. Half of those free from pyorrhoea showed spongy gums and retraction. These natives live on beer and gruel and eat no hard food.

A. G. B.

LE DANTEC (A.). **Les maladies varioliformes exotiques (Alastrim, Amaas, Foué-foué).**—*Jl. Méd. de Bordeaux.* 1924. May 10. Vol. 101. No. 9. pp. 335–340. With 2 figs.

Apropos of a case of varioloid in a Martiniquian sailor who landed at Bordeaux and was sent to a general hospital with the diagnosis " alastrim " the author discusses the diseases named alastrim, amaas, foué-foué and " endémie varioliforme de Stanley Pool," and considers their relation to smallpox. Alastrim was first reported in the coffee plantations of São Paulo, and there were warm discussions as to its identity or non-identity with smallpox. During the dispute, no sanitary barrier being opposed, it invaded most of the islands of the Antilles. Amaas is a term of South African origin, which first appeared in the literature in 1904. Foué-foué is the native name of a similar disease which in 1900 was seen in the forest region of the French Soudan. Lastly, " endémie varioliforme de Stanley Pool " was described in 1923 by VAN HOOF [but see this *Bulletin, ante,* p. 845, where the disease is called alastrim].

The author considers the arguments of the unicists and dualists. He admits that, the nature of the virus of smallpox itself being unknown, the question cannot be scientifically settled, and states that Paul's reaction is not absolutely specific; he claims that the properties of mildness and malignancy form too slight a base for separation, and points to the virus of plague which may kill everyone attacked, as in Manchuria, or be comparatively benign, as in Paris in 1920; the history of smallpox reveals epidemics of diverse virulence. Finally he lays down: In the present state of knowledge any varioliform disease which can be combated effectively by vaccination ought to be regarded as variola. Inversely, any varioliform disease which is not prevented by vaccination is not variola. And he points out that the difference which to-day separates the partisans of identity or non-identity of alastrim and smallpox is the same as that which 100 years ago separated the partisans of identity or non-identity of variola and varicella; the deciding factor was the success of vaccination. Similarly, the veterinarians separated sheep-pox from cow-pox, by the vaccination test. In proof of the effectiveness of vaccination in alastrim he quotes BAUJEAN (*ante,* p. 329). The term alastrim ought to disappear.

A. G. B.

i. BLANC (Georges) & CAILLON (Louis). **Sur une mycose aspergillaire observée en Tunisie.**—*Bull. Soc. Path. Exot.* 1924. May 14. Vol. 17. No. 5. pp. 243–345. With 1 fig.

ii. LANGERON (Maurice). **Un** *Sterigmatocystis* **nouveau, parasite de l'homme en Tunisie:** *S. tunetana* **n.sp.**—*Ibid.* pp. 345–347. With 1 fig. [3 refs.]

i. The authors describe an ulcerated tumour, about the dimensions of a five-franc piece, gradually developed in the course of a year on the back of the hand of a Tunisian of 60 years. It began as two small nodules and was never very painful. The arm was considerably atrophied, the epitrochlear gland was as big as a pigeon-egg and the axillary and subclavicular glands also were enlarged. No "grains" or mycelial fragments were observed; but from the serum, and afterwards from the enucleated tumour, an aspergillus was isolated which the authors—though well advised of the need for caution in making such an inference—regard as being the pathogenetic agent. The patient was submitted to a stiff iodide treatment, but made an unceremonious departure from hospital.

ii. The aspergillus of the above case is here described and figured as a new species, *tunetana*, of the genus *Sterigmatocystis*. It is near to *S. versicolor* and also to *S. bicolor*, but has peculiarities of size as well as of mode of colour evolution. The colonies are at first a downy white and then, with the appearance of the conidia, a greenish blue; later, ochreous spots show, and finally the whole colony assumes a dark, tawny-orange tint.

A. A.

VERBRYCKE (J. Russell). **Tularemia: with Report of Fatal Case simulating Cholangeitis, with Postmortem Report.**—*Jl. Amer. Med. Assoc.* 1924. May 17. Vol. 82. No. 20. pp. 1577–1581. With 7 figs. [7 refs.]

The patient in this interesting and admonitory case was a widow of 67, of excellent health but with a history of recurring acute attacks of indigestion up to ten years before a present sudden onset of fever. Seen a few hours after that onset she had a temperature of 103° F., and was deeply jaundiced. Though there was no pain or abdominal tenderness, the symptoms, along with the old history, justified a diagnosis of acute inflammation of the bile-ducts. At the end of the 3rd day the temperature fell to normal, but rose again and thereafter continued from 102°–104° F. in the evening with a remission in the morning. There was slight albuminuria, and three successive counts gave 12,000, 15,400 and 19,200 leucocytes. An operation was proposed, and was performed on the 12th day. Nothing was found wrong, so the abdomen was closed and the diagnosis repudiated. At a final examination a little before the operation a thing that looked like a blood-blister had been noticed on the right index-finger, and while the patient was still under the anaesthetic this was incidentally attended to and found to cover a slough about as big as a sixpence. The idea of tularaemia then occurred to the author in the last resort, but the patient could not remember any dealings with rabbits within an interval of 8 months from her illness, when she certainly had kept animals supposed to be rabbits. As blood examinations, blood-cultures, and ordinary serum-tests supplied no information, serum was sent to Dr. FRANCIS for the agglutination test; but before the positive verdict was returned the patient had succumbed—on the 18th day of illness.

At the post mortem examination nodules ranging in size from a shot to a walnut were found in the lungs; and the spleen was enlarged, almost fluid, and full of little yellowish-white miliary points pronounced by Dr. FRANCIS to be exactly like those seen in tularaemia rabbits. Laboratory animals inoculated from the spleen died in four days, with typical tularaemia lesions at necropsy and yielding the tularaemia bacillus.

Subsequently it was remembered that 5 days before the patient felt ill she had skinned, dressed, and cooked a pair of rabbits, and 2 days after that had got a splinter into her right index finger.

A. A.

VAMPRÉ (Eyobras). **Contributo allo studio del "mal de engasgo." (Disfagia da spasmo del cardias.)** [Contribution to the Study of Endemic Dysphagia.]—*Policlinico.* Sez. Med. 1924. May 1. Vol. 31. No. 5. pp. 279–292.

This paper constitutes a summary of the condition known as "Mal de Engasgo"; this has many synonyms, of which "cardiospasm" appears to be the most descriptive. The chief symptom is an intermittent contraction of the lower end of the oesophagus leading to secondary dilatation above it. The question has been dealt with previously in this *Bulletin* (Vol. 18, p. 301) and the present paper does not contribute any new facts. The author supports the idea of a parasitic origin, because of its endemic prevalence, although no causative organism has yet been found. Heller's operation—section of the circular muscular fibres of the cardiac end of the oesophagus by two opposite longitudinal incisions—is said to be completely successful in effecting a cure.

H. Harold Scott.

PITTALUGA. **Dos casos de tripanosomiasis y uno de kala-azar infantil.**—*La Medicina Ibera.* Madrid. 1923. Apr. 21. No. 285. p. 343. (Real Academia Nacional de Medecina. Section 7 April 1923.) [Summarized in *Arch. f. Schiffs- u. Trop.-Hyg.* 1923. Vol. 27. No. 12. p. 454.]

Two Europeans, with trypanosomiasis contracted in Fernando Po, were treated with Bayer 205 with complete success. One received in all 17 gm. He had slight albuminuria after the second injection and a relapse 14 days after the third. The initial dose was 0·5 gm., raised later to 1·25 gm. A case of kala azar in a 6-year-old child was treated with "Stibenyl Heyden," given intravenously on alternate days. The spleen swelling was reduced by more than half. This disease is common in Spain in the interior as well as on the Mediterranean coast and contributes notably to the child mortality.

A. G. B.

TIRUMURTI (T. S.). *Rhinosporidium seeberi* (*Kinealyi*) **in a Malabar Woman.**—*Lancet.* 1924. Apr. 19. p. 802.

The author is of opinion that the infrequency of recorded cases of Rhinosporidium infection in women—this appears to be the first case in his own experience—is merely the result of non-observation, or, rather, of infrequency of microscopic examination. The case here recorded is a typical case of long anterior (twenty years) initiation and frequent recurrence, or, rather, persistence in spite of serious operations for removal. The patient is still under treatment with local applications of tartar emetic.

A. A.

FORSYTH (W. Leonard). **Rhinosporidium Kinealyi.**—*Lancet.* 1924. May 10. pp. 951–952. With 2 text figs.

The tumour started fifteen years back in the left nares, and persisted there until 3 months before the patient's admission, when it disappeared spontaneously; but fresh growths then appeared in the adjacent lachrymal sac, lower eyelid (subcutaneous and subconjunctival) and malar region. The patient came from Calicut, Malabar.

A. A.

SAZERAC (R.) & VAURS (R.). **Du rôle de la phagocytose dans l'action du bismuth sur les trypanosomes et les spirochètes.**—*C. R. Soc. Biol.* 1924. July 18. Vol. 91. No. 25. pp. 430–432. [2 refs.]

The experimental observations of the authors are to the effect that insoluble bismuth when injected in suspension into the peritoneal cavity of laboratory rodents is visibly phagocyted, particularly by the large mononuclears, the number of which is greatly increased locally. With a non-toxic dose the process continues for about 10 days. The phagocytes, it is assumed, must dissolve the metallic granules and discharge the solution. Probably the same process of engulfment and diffusion by phagocytes occurs when insoluble bismuth salts are injected into muscle or subcutaneously.

A. A.

RIBÓN (D. Victor). **El yagé. (Memorándum de viaje, por Joaquin Rocha, regiones amazónicas 1905, casa editorial de "El Mercurio.")**—*Siglo Med.* 1924. May 31. Year 71. Vol. 73. No. 3677. pp. 542–543.

Yagé is the name given to a drink prepared by the natives from a small shrub. It is used as a purgative but is not devoid of danger, since it may produce symptoms similar to those of *Cannabis indica.* The period of "delectable visions" is short and rapidly gives place to delirium and terror. The author relates an instance in which a man took a dose for its purgative effects and passed into a maniacal condition, "howling like a dog, bellowing like a bull, crouching like a tiger, and believing himself transformed into one of the feline race." Individual susceptibility to the effects is very variable.

H. Harold Scott.

BLANCHARD (M.) & LAIGRET (J.). **L'innocuité complète de la ponction lombaire chez les indigènes du Congo.**—*Presse Méd.* 1924. June 14. Vol. 32. No. 48. pp. 518–519.

For about 15 years lumbar puncture has been frequently performed at the Brazzaville Pasteur Institute for the diagnosis of sleeping sickness, and especially in the last five, now that it has become the only certain test of the result of treatment. In 1923 there were 1,542 punctures. With the patient seated, 10–20 cc. are withdrawn slowly through a needle of large calibre. He then walks away and resumes his task. Native infirmières are not always strict about asepsis, and many of the patients are suffering from intercurrent affections, sometimes septicaemic, but no accident has ever occurred. Post-puncture headache is unknown. The patients are seen weekly, or more often, and no symptom, either early or late, attributable to the puncture has ever been observed. The authors ask if this is due to the same cause as the harmlessness of arsenobenzol. Very many injections have been given for sleeping sickness (first stage), for yaws, for relapsing fever, 0·6 to 0·9 gm., but with never a bad symptom. Alcoholism apart, it is the more sophisticated persons that suffer from after effects.

A. G. B.

VISCO (Sabato). **Osservazioni sull' alimentazione esclusiva e prolungata dei ratti con semi di** *Lathyrus Sativus*, [Observations on the Effect of Prolonged Feeding of Rats on the Seeds of *Lathyrus sativus* exclusively.]—*Arch. Farmacol. sperim. e Science affini.* 1924. June 1 & 15. Year 23. Vol. 37. Nos. 11 & 12. pp. 269–272; 273–277.

LIOTTO, after observing for 6 weeks adult white rats fed exclusively on flour made from *Lathyrus sativus*, drew the following conclusions :—(1) That such a diet did not give rise to any particular morbid changes in such animals; (2) That storage of nitrogen ran parallel with the body-weight, an indication that Lathyrus contains proteins of high nutritive value.

Seeing that, in man, symptoms of paraplegia often do not declare themselves for 7–10 weeks, the author repeated these experiments, keeping up his observations for four months, but could detect no harmful effects. He then repeated the tests with *young* rats. He separated them into two groups of four (each of 3 males and 1 female), and fed one group on bread and milk, and the other on the Lathyrus exclusively. No paralytic symptoms developed in the latter, but it was noticed that the gain in weight was considerably less. Whereas the three males fed on bread and milk increased in the first 74 days 118, 110, and 106 per cent. respectively, and the female 82 per cent., of those fed on Lathyrus flour, the gain in the males was 68, 49, and 23, and in the female 37 per cent. The difference in growth is ascribed to deficiency of vitamin A in Lathyrus as compared with the bread and milk.

H. Harold Scott.

BARTHELEMI (V.). **L'âge de la puberté chez les jeunes filles nègres.**—*Ann. Soc. Belge de Méd. Trop.* 1924. Jan. Vol. 3. No. 3. pp. 263–272.

The author examined the girls of 324 families, 373 in all, belonging to Lusambo and its neighbourhood; 175 were between 10 and 20 years of age. In only 11 cases could he get the exact age ; in the rest, it was estimated from the recollection of the parents of events contemporary with the birth. He relied on the appearance of the breasts, of which he lists 5 stages, and measurements of the pelvis of girl and mother ; a vaginal examination was made in three instances.

Tables for the girls of known and estimated age show the state of the breasts, height, chest measurements, "envergure" [spread of arms?], pelvic measurements in some instances, and information as to the onset of puberty, appearance of hair on pubes and axilla, menstruation. The conclusion is that the development of the generative function in negroes is by no means as early as has been maintained, that puberty in the black female normally begins with the 15th year, and that it is only between the 16th and 17th year that she can be considered as marriageable. RODHAIN, with reservations on the accuracy of the ages of many of the girls, concurred in the author's conclusions.

A. G. B.

FOSTER (John H.). **A Study of the Vital Capacity in Chinese.**—*China Med. Jl.* 1924. Apr. Vol. 38. No. 4. pp. 285–294. With 4 charts in text. [14 refs.]

The vital capacity of the lungs (measured by various spirometers) is defined by HOWELL as " the volume of air that can be breathed out by the deepest possible expiration after making the deepest possible inspiration." The normal standard is commonly expressed in relation to height (HUTCHINSON) or relation to body surface (WEST); but it has also been investigated in relation to weight and chest-volume, which are regarded as less reliable. The author, who considers that the determination of vital capacity should be included in the routine of physical examinations and be part of the clinical record in cardiac and pulmonary disease, has investigated and here recorded the normal vital capacity of 500 healthy Chinese (425 men of various occupations and 75 women), and finds it to be considerably lower than that of healthy Americans as recorded by WEST, as thus shown :—

Vital capacity,	American men	Body surface ratio	2·50	Height ratio	25·0
ditto	American women	ditto	2·00	ditto	20·0
ditto	Chinese men	ditto	2·00	ditto	19·0
ditto	Chinese women	ditto	1·50	ditto	14·0

A. A.

i. KELLY (William P.). **Hydrocele amongst the Lango of Uganda.**—*Brit. Med. Jl.* 1924. Apr. 26. pp. 746–747.

ii. KELLERSBERGER (E. R.). **A Case of Elephantiasis from the Belgian Congo.**—*Jl. Amer. Med. Assoc.* 1924. Apr. 12. Vol. 82. No. 15. pp. 1197–1198. With 3 text figs. [2 refs.]

iii. HECKENROTH (F.) & BÉDIER (E.). **Un cas d'encéphalite épidémique à forme myoclonique chez un Européen à Dakar.**—*Bull. Soc. Path. Exot.* 1924. Mar. 12. Vol. 17. No. 3. pp. 275–279. With 1 chart.

iv. TALIAFERRO (W. H.) & HUCK (J. G.). **The Inheritance of Sickle-Cell Anaemia in Man.**—Reprinted from *Genetics.* 1923. Nov. Vol. 8. pp. 594–598. With 2 figs. [3 refs.]

v. SUMIWO (Shin). [**On Infrequent Pulse among the Prisoners in the Toyotama Jail. A Form of Disease simulating Oedematous Disease.** *Chugwai Iji-Shimpo* (*Central Jl. of Med.*). 1923. Nov. & Dec. Nos. 1146 & 1048. [Summarized in *Japan Med. World.* 1924. Mar. 15. Vol. 4. No. 3. p. 69.]

vi. BANERJEE (Dhirendra Nath). **Normal Arneth Blood Picture in the Tropics, with Special Reference to Bengal.**—*Calcutta Med. Jl.* 1924. Feb. Vol. 18. No. 8. pp. 615–617. [1 ref.]

vii. KLEINE (F. K.). **Robert Kochs Protozoënuntersuchungen und ihr Einfluss auf die weitere Forschung.** [Robert Koch's Protozoal Investigations and their Influence on Further Discoveries.]—*Deut. Med. Woch.* 1924. Apr. 4. Vol. 50. No. 14. pp. 423–426.

i. Hydroceles are common in this Nile tribe and often become large and cause disability. The author describes an operation in which there is excision of the redundant scrotum and complete deep haemostasis.

ii. A huge scrotal tumour, figured, was removed, weighing 85 lb.

iii. The case, which is fully described, is the third at Dakar in the last two years.

iv. This paper contains evidence showing that "sickle-cell anaemia in man is an inherited condition and behaves as a single Mendelian character which is dominant over the normal condition and which is not sex-linked."

v. The infrequent pulse was followed by oedema and in severe cases by death. The cause was believed to be vitamin deficiency, differing from that of beriberi.

vi. From the result of examination of 100 healthy Bengalis in Calcutta the author concludes that their normal Arneth index is 52·55.

vii. The author, who was for long associated with KOCH both in Berlin and in Africa, finds that his discoveries are not so well known as they should be, and here recounts the story of KOCH's work on protozoal diseases of the tropics.

A. G. B.

ROCKY MOUNTAIN FEVER (CORRESPONDENCE).

HAYASHI (N.) & TAKEUCHI (N.). **An Etiological Study on Rocky Mountain Spotted Fever.**—*Aichi Jl. Experiment. Med.* Nagoya. 1923. Mar. 31. No. 1. pp. 69–74. With 5 plates. [9 refs.]

In reference to the summary of this paper [*ante*, p. 664] a letter has been received from Prof. S. B. WOLBACH strongly criticizing the conclusions reached by the authors, which he regards as untrustworthy, and stating that the material studied was supplied by himself. He informs us that he is sending a note on the subject to the *Aichi Journal of Experimental Medicine.*

REVIEWS AND NOTICES.

COTONI (L.). TRUCHE (C.) & RAPHAEL (A.). English Edition by PAGE (D. S.) & MORTON (Eva). **The Pneumococcus and Pneumococcal Affections.**—pp. viii+218. With 6 figs. & 40 charts. 1924. London: John Bale, Sons & Danielsson, Ltd., Oxford House, 83–91, Great Titchfield Street, Oxford Street, W.1. [Price 16*s.* net.]

We are not so informed, but it seems probable that this book, in its English dress, owes its existence to the fact that in English-speaking countries, especially America, the pneumococcus has been the subject of very special detailed study in recent years, and a revival of interest has occurred in the possibilities of a rational serum-therapy. The French authors take the opportunity of collating in this volume the bacteriological studies on the pneumococcus which they and others have carried out during the past twelve years in the laboratory of Dr. M. NICOLLE at the Pasteur Institute and under his direction. The main object of their work was to establish the serum treatment of pneumonia on a sound basis, and to this end the authors have investigated with considerable care and patience those cultural and other properties of the pneumococcus such as virulence, serological affinity, etc., which have also enlisted the energies of many workers in this country and in America.

To such workers the amply recorded data of the French authors on cultural methods, maintenance of virulence, bile-solubility and the properties of immune serum will make a special appeal, even though they may be already conversant with the gist of the French work as published. It is doubtful, however, whether the book will make the same appeal to the general medical reader who, though sincerely interested in serotherapeutic developments, must only be wearied by prolix recording of experimental data the significance of which he has not learned to appreciate.

Certain features of the book deserve special mention. The phenomenon of the crisis in pneumonia receives very full treatment, and the conclusion is reached that it is the expression of a hypersensitiveness on the part of the body to a sudden flooding with pneumococcal toxin liberated from the organisms by lytic antibodies. Some experiments on guineapigs are adduced to support this view, but they simply whet one's appetite for further data of the kind with fuller controls.

Very detailed accounts are given of therapeutic tests with pneumococcal serum which a number of French doctors have made in recent years with gratifying success. Apparently in France matters have not yet reached the stage when, as in America, difficulties arising partly from lack of protective power exhibited by pneumococcal serum prepared from certain serological types, and partly from the massive doses of serum required for efficient treatment, have begun to militate against its general use. The French authors use a multivalent serum, and the doses appear to have been of the order of 80 to 100 cc. on the first day, followed by daily doses of 20 to 40 cc. if no improvement has resulted from the primary dose. It is in lobar pneumonia that the serum displays its most impressive effect.

The English translation has been admirably carried out and—an unusual feature in French books—a most useful bibliography closes the volume. The price of the book is unfortunate if a large sale is desired. It contains many simple temperature charts and only half-a-dozen indifferent photomicrographic reproductions of the pneumococcus, which might have been dispensed with at this time of day.

J. C. G. Ledingham.

TROPICAL DISEASES BUREAU.

TROPICAL DISEASES BULLETIN.

Vol. 21.] 1924 [No. 12

HELMINTHIASIS.

Leiper (R. T.). **Present-Day Teachings on Helminthology in Relation to Public Health.**—*Brit. Med. Jl.* 1924. July 19. pp. 110–113.

Leiper alleges a lamentable ignorance of facts and principles of helminthology to be a failing common among medical officers of health. He puts the blame upon those teachers and textbooks of hygiene that profess to deal with the subject, and as a public duty he condemns out of their own mouth these blind leaders of the blind But to guard them all from the ditch he here provides a useful summary of those generalities concerning helminth transmission that are of constant and fundamental significance for the public health. He briefly illustrates and expands the established propositions that: (*a*) Parasitic worms do not increase in the body of a human host, though they produce a multitude of eggs or embryos there; (*b*) these eggs or embryos must, as a necessary prelude to any prospective infection, be discharged from the host in which they were produced; (*c*) these eggs or embryos, after their discharge, must undergo certain developmental changes in the external environment before they attain a stage infective to man; (*d*) these developmental changes can go on only under certain definite conditions of this environment, the necessary conditions varying with the different species and sometimes being protracted and recondite; (*e*) the infective form may enter the body of the prospective host in various ways proper to the particular species; (*f*) after effecting an entry into the proper host the immature infective form may have to undergo a circuitous journey before it reaches the particular site where it can attain sexual maturity; (*g*) many of the parasitic worms of man are common to him and certain domestic animals; (*h*) the control of helminth infection depends upon a knowledge of the specific life-cycles and their vulnerable points.

A. Alcock.

MIYAGAWA (Yoneji). **Recent Progress in Parasitology made by Japanese Investigators.**—*Far Eastern Assoc. Trop. Med. Trans. Fifth Biennial Congress, Singapore,* 1923. pp. 420–433. *Scientific Reports from Govt. Inst. for Infectious Diseases.* Tokyo. 1923. Vol. 2. pp. 473–484: and *Japan Med. World.* 1924. Oct. 15. Vol. 4. No. 10. pp. 251–257.

This paper briefly summarizes the outstanding discoveries in medical helminthology by Japanese investigators during recent years. These have already been annotated in the *Tropical Diseases Bulletin* from time to time and recently summarized in a critical review. [It is regrettable that there is no bibliography with the article.]

R. T. Leiper.

CORT (William W.). **Lectures in Helminthology, delivered at the Manchuria Medical College, Nov. 12 to 15, 1923.**—*Jl. Oriental Med.* Dairen. 1923. Nov. & 1924. Feb. Vol. 1. No. 4; Vol. 2. No. 1. pp. 183–188; 1–20. [16 refs.]

In four lectures at the Manchuria Medical College Dr. Cort analysed first some of the factors influencing the distribution and incidence of worms parasitic in man, then considered in detail the factors which are influencing the spread of the more important trematode infestations in the Orient and the methods available for their control. Thereafter are summarized the recent investigations on the life cycle of Ascaris and hookworm and their bearing on the control of human infections.

R. T. L.

JOYEUX (Ch.). **Liste de quelques helminthes récoltés dans les colonies portugaises d'Afrique.**—*Ann. Parasit. Humaine et Comparée.* 1924. July. Vol. 2. No. 3. pp. 232–235. With 1 fig. [10 refs.]

During a brief visit to St. Paul-de-Loanda for the Congress of Tropical Medicine, a collection of parasites was made in Angola and Mozambique. The list includes the following of medical interest :—

(a) *Cattle.* Hydatid cysts are common in Loanda and Lorenço Marques. *Cysticercus bovis* (larva of *T. saginata*) occurred in 10 per cent. of the cattle examined at Benguela and was common at Loanda and at Lorenço Marques. *Fasciola hepatica* found at Lorenço Marques and Loanda. *Fasciola gigantica* at Loanda, Benguela, Mossamèdes, Lorenço Marques.

(b) *Pigs.* *Cysticercus cellulosae* (larva of *T. solium*) frequent at Loanda, at Benguela (nearly 10 per cent.) and Lorenço Marques.

R. T. L.

FAUST (Ernest Carroll). **Observations on North China Intestinal Parasites of Man based on an Intensive Examination of Patients in a Medical Ward of the Peking Union Medical College Hospital.**—*Amer. Jl. Trop. Med.* 1924. July. Vol. 4. No. 4. pp. 411–437. [6 refs.]

An intensive study of 60 third-class patients in the medical service of the Peking Union Medical College Hospital was undertaken to determine the importance of parasitic infection in clinical diagnoses in North China. Every stool of the patient was examined during a period of ten days or more, and in all 1,409 stools, averaging 23·48 per patient, were dealt with. It was found that concentrative methods only added 10 per cent. to the findings where large numbers of stools of the same patient were examined. 40 per cent. of the infections were diagnosed after the 1st day, 35 per cent. of which were diagnosed first from unconcentrated preparations. The incidence of entozoal infection was 80 per cent., and is less intensive than that of a sick population in Central China. The clinical significance of these studies is demonstrated by the fact that 53·3 per cent. of the series harboured clinically important parasite infections. 20 per cent. had a major diagnosis due to parasites, 46·6 per cent. a minor diagnosis of parasites, and 13·3 per cent. had both major and minor diagnoses occasioned by entozoal infections of the digestive tract. At least 89 per cent. of the patients had acquired infection in North China. It was observed that although the Chinese as a people are not less susceptible to parasitic infection than other peoples, light infections among them are less likely to be clinically significant than in Occidentals living in China. All the infections observed were the result of improper night soil disposal.

R. T. L.

LI (K. H.). **Incidence of Parasitic Helminths in Soochow. A Preliminary Report.**—*Nat. Med. Jl. China.* 1924. Feb. Vol. 10. No. 1. pp. 7–19. [3 refs.]

At the Soochow Hospital the author has conducted a microscopical examination of the faeces of 1,034 in-patients, and has analysed his findings according to age, sex, occupation, residence and incidence of specific infections in combination, etc. High and severe infections were generally found in the poor and in young children. With advancing age and scholastic standing the degree of intestinal infestation appeared to decrease. The percentage of infections in the 1,034 cases were :— Hookworm 16·6 per cent., Ascaris 40·0 per cent., Trichuris 13·7 per cent., Schistosoma 3·1 per cent., Fasciolopsis 0·8 per cent.

R. T. L.

BERNARD (P. Noël), BABLET (J.) & PONS (R.). **Les vers intestinaux en Cochinchine.**—*Bull. Soc. Path. Exot.* 1924. July 9. Vol. 17. No. 7. pp. 577–582. [13 refs.]

Although there are numerous records of helminthic infection among the indigenous population of Cochin-China, no complete statistics have been published. The authors, in order to remedy this defect, carried out 2,878 faecal examinations. The paper being statistical in nature does not lend itself to abstraction, but the results obtained are given also in a Table comparing these with the findings of previous investigators in Annam and Tonkin. An abstract from this Table is the following :—

Number examined	2,878
Percentage infected	85·20
Ascaris lumbricoides	71·30
Ankylostomes (mostly *A. duodenale*)	37·75
Trichuris trichiura	18·35
Oxyuris vermicularis	0·20
Strongyloides intestinalis	1·60
Taenia	1·40
Trematodes (*F. buski* in provinces)	0·1 to 3

Among the Europeans infection is much less. In Saigon the percentages were Ascaris 12, Trichuris 12–15, Ankylostomes and Strongyloides 1 each, Oxyuris and Taenia 0·2.

H. Harold Scott.

SAITO (Tohru), HIYAMA (Tatewo) & NAGAMINE (Michiwo). **[Report on the Examination of the School Children for Intestinal Parasites. Influences of Ascaris on the Body Development and Learning Capacity of the School Children.]**—*Chiba Igakkwai Zasshi* (*Jl. Chiba. Med. Soc.*). 1924. Jan. Vol. 2. No. 1. [Summarized in *Japan Med. World.* 1924. Apr. 15. Vol. 4. No. 4. p. 96.]

82·2 per cent. of 1,266 school children in a seaside village in Japan were found, from microscopical examination of the faeces, to harbour Trichocephalus 67·6 per cent., Oxyuris 1·8 per cent., Ankylostoma 5·5 per cent., *Trichostrongylus orientalis* 13·2 per cent., *Metagonimus yokogawai* 0·1 per cent., *Hymenolepis nana* 0·3 per cent., and Ascaris 44·5 per cent. The children harbouring Ascaris were shorter than the normal children and had less memory and thinking capacity. The infection among the children is stated to have been less than that among the farming villagers and higher than in city children.

R. T. L.

SWEET (W. C.). **The Intestinal Parasites of Man in Australia and its Dependencies as found by the Australian Hookworm Campaign.**—*Med. Jl. Australia.* 1924. Apr. 26. Year 11. Vol. 1. No. 17. pp. 405–407. [8 refs.]

Although this paper is a brief one, the amount of work of which it is the record was enormous. The author is Director of the Australian Hookworm Campaign and, with his associates, he had carried out examinations in the various parts of the Continent to determine the prevalence of helminthic infection. In all, 248,721 persons were examined, 202,582 in Australia and 48,139 in Papua and New Guinea. 19·4 per cent. of the whole were infected with hookworm. *Trichuris trichiura* was found in 4 per cent.; in the south it was only 1 per cent., and the rate increased as the investigation proceeded into the more tropical districts. *Ascaris* infection was low in Australia, varying between 0·2 and 2 per cent., the latter occurring in Cape York Peninsula; in Papua and New Guinea about 12 per cent. were infected. *Hymenolepis nana* was found in 0·4 per cent. of inhabitants of New Guinea. *Taenia* was rare, being seen in only 42 instances; the species of 25 of these was not stated in the report, but of the remainder *T. solium* occurred in six, *T. saginata* in eleven; the rarity of the latter in a country where so much beef is raised and consumed is remarkable. Of still rarer infections *Hymenolepis diminuta* was met with five times, *Diphyllobothrium latum* twice (both of these persons had come from Finland), *Clonorchis sinensis* twice (both in Chinese), and *Haemonchus contortus* [which has once only, in South America, been recorded from man previously] occurred three times amongst the aborigines of the Moore River Settlement in Western Australia.

H. H. S.

KOLPAKOWA (T. A.). **Materialien zur Statistik der Helminthiasis-Erkrankungen unter der Bevölkerung von Leningrad in den J. 1918–1923.** [Material for the Statistics of Helminth Infections in the Population of Leningrad 1918–1923.]—*Rev. Microbiol. et Epidémiol.* Saratov. 1924. Vol. 3. No. 1–2. In Russian pp. 81–85. German summary p. 109.

As worm infections depend more or less on the general mode of living, and on their dissemination in foodstuffs, the conditions in Leningrad during the revolutionary years with the vast upheaval in family life and the acute hunger which prevailed were very favourable to the spread of helminth infections. With the cessation in the sales of eatables in 1918 the population were reduced to exchanging their ration cards for a hunger ration consisting of one sixteenth to one quarter of a Russian pound of black bread, mixed with chaff, and a dried herring. Conditions like these did not raise considerations of purity or cleanliness in the mind, and frequently hospital patients could be seen collecting herring heads and other garbage from refuse bins. Moreover, the houses were without water, soap or fuel. The yards and waste grounds became covered with excreta. By 1919 the population had fallen from 3,000,000 to 700,000.

The author studied the incidence of helminth infection at the laboratory of the Medical Institute 1917–1921, and at the Bacteriological Laboratory, Farpoda, in 1922–23. In 1917 the investigations were made upon soldiers just returned from the trenches to the Military Hospital, and gave an infection rate of 64·5 per cent. In 1918–20, 156 persons in Leningrad were examined, and of these 26–28 per cent. were found infected. One case of *Hymenolepis nana* was found; a child of 6 years of age who for about 2 years had suffered from epileptic fits. Only about eight cases have been recorded hitherto for Russia. In 1921 the percentage of infestations with helminths rose to 37·78 per cent., due chiefly to *Ascaris lumbricoides* (9·7 per cent. to 23·8 per cent.). In 1922–23 of 380 inhabitants 32·8 per cent. were infected, of which 20·5 per cent. were due to *Ascaris lumbricoides.* These figures seem to show little change from those recorded for Leningrad in 1888, in spite of the advance in culture. The infections with *Dibothriocephalus latus* and *Trichuris trichiura* had not changed materially. *Taenia solium* and *T. saginata* had lessened from 3 per cent. to 1·3–0·52 per cent., but *Ascaris lumbricoides* had risen from 5 per cent. to 20–23 per cent. The explanation probably is that during the war period meat ceased to be used for food.

In 1919, 134 Finnish workmen were evacuated from the interior of Finland to Leningrad. The percentage of infected was 37·3 per cent. (with *Dibothriocephalus latus* 32·82 per cent., *Ascaris lumbricoides* 1·48 per cent., *Oxyuris vermicularis* 0·72 per cent. and *Taenia solium* 0·72 per cent.).

In 1918–1923 the increase in helminth infection in Leningrad occurred, in 1921 up to 37·3 per cent., chiefly due to *Ascaris lumbricoides* (63·3–68 per cent.). Such increase was due to the insanitary conditions which prevailed at the front, and their employment upon earth works probably accounted for the rise of *Trichocephalus* to 36·7 per cent. amongst the soldiers.

R. T. L.

HALL (Maurice C.). **Anthelmintics.** [Correspondence.]—*Lancet.* 1924. Sept. 13. pp. 577–578.

The author, apropos a previous article in the *British Medical Journal,* points out the fact that carbon tetrachloride has apparently no minimum lethal dose in the ordinary sense of the term. Thus, dogs will tolerate more than 80 times the dose found effective for their hookworms, and human subjects have taken as much as 50 cc. without ill effects, and when deaths have occurred they have followed the administration of a therapeutic dose. It seems, therefore, that the factor determining toxicity resides in the patient, namely, in such conditions as favour absorption of the drug; for example, gastro-enteritis, nephritis, cirrhosis of the liver. Oil of chenopodium, on the other hand, has a safety factor of only five. He points out that some anthelmintics act as their own purgative, as arecoline hydrobromide, others, as carbon tetrachloride, are mildly laxative, while others again, as oil of chenopodium, are actually constipating. The two latter, therefore, should be accompanied by a purgative, since removal is the aim of treatment. Since so little is known regarding the specific action of anthelmintics investigations to correlate anthelmintic efficiency with chemical composition and physical properties would probably be the most profitable line of research.

H. H. S.

HALL (Maurice C.). **Anthelmintic Warfare.**—*U.S. Nav. Med. Bull.* 1924. Sept. Vol. 21. No. 3. pp. 286–293. [1 ref.]

This is a lecture delivered at the United States Naval Medical School, and, though it does not bring forward any new factor—it was not intended to—it must have been very interesting to hear. A clever analogy is drawn between attacks on the enemy's position in warfare and anthelmintic treatment, showing how the foe may be attacked frontally by oral administration of drugs in repeated small doses or by mass attacks with bulky anthelmintics of low toxicity; or a rear attack, by rectal injection as for oxyuris, by flank attacks as by injections of tartar emetic for schistosomiasis, and so forth.

H. H. S.

MAY (Percy). **Anthelmintics and their Nomenclature.** [Correspondence.]—*Lancet.* 1924. Aug. 2. p. 248.

In this letter the author straightens out the confusion which has arisen from the use of the name "wormseed" to denote different plants employed as anthelmintics. *Artemisia maritima,* from which santonin is obtained, covers many species. The specimen so labelled at Kew corresponds with the Russian wormseed (though not strictly a seed). American wormseed, however, belongs to the Chenopodium family, the active principle of which is Ascaridol in the oil derived from the fruit. It contains no santonin. In a recent German publication the terms Wormseed oil (Wurmsamenöl) and Ol. chenopodii were used indiscriminately for the same preparation.

H. H. S.

BLANCHARD (M.) & LAIGRET (J.). **Pseudo-helminthiase intestinale.**—*Bull. Soc. Path. Exot.* 1924. July 9. Vol. 17. No. 7. p. 583.

A European consulted various medical men in order to be treated for "small worms, about 1 cm. in length," which, he stated, he was continually passing. Stools were sent up again and again but no worms or ova were seen. He was, however, treated both internally and locally for oxyuriasis with every anthelmintic in the pharmacopoeia, but without result. Finally the patient was asked by the authors to send, not the stool but some of the worms. These proved to be fly larvae which were growing in the faecal deposit, the patient frequenting the same spot each day for defaecation. He thought that he himself had passed them, while the pruritus of which he complained was suggested by the question frequently put to him by the medical men to whom he had applied for treatment.

H. H. S.

DA SILVA (Gastão Pereira). **A proposito de um caso de bradycardia occasionada pela helminthiase intestinal.**—*Brazil Medico.* 1924. May 24. Year 38. Vol. 1. No. 21. pp. 290–291.

Apropos a case recently described as suffering from "cardiac neurosis" the author relates the two following :—(1) A man 19 years of age, after an attack of influenzal bronchitis, had a pulse-rate of 55 per minute. On suspicion of helminthic infection, a dose of calomel and santonin was given, and 6 large ascarides were expelled. Within 24 hours the pulse-rate was normal. (2) A boy of 15 years was suffering from cardiac distress, with crises of dyspnoea, a blowing murmur over the mitral area, and marked anaemia. Ankylostome ova were found on faecal examination. The symptoms cleared up entirely after treatment for the hookworm and the anaemia.

H. H. S.

SPARAPANI (Giuseppe Carlo). **De quelques modifications produites sur l'action toxolytique du suc d'autolyse hépatique par les toxines de la douve du foie et de l'échinocoque et sur les modifications déterminées par les toxines en question sur la fonction glycogénique du foie.**—*Jl. Physiol. et Path. Générale.* 1924. Apl. Vol. 22. No. 2. pp. 341–344. [18 refs.]

The autolytic extracts of the liver for these experiments were obtained in the following way: A small piece of liver was taken aseptically at the slaughter-house, the blood expressed and washed out from it, and the tissue placed in a sterile tube which was then carefully corked and kept for 6 days at 38°C. The fluid which collected at the bottom was freed from tissue fragments by centrifugation. Extracts were thus obtained from normal pig's liver and from livers infected with Echinococcus and Fasciola. In order to test the action of these extracts haemolytic toxins were employed. 2 cc. of *the toxin* were placed in each of fifteen tubes and one to fifteen drops of the extract were added. In each tube, after being kept for 8 hours in the incubator, was next placed 5 drops of an emulsion of rabbit's corpuscles in citrate-saline and the results noted at the end of 24 or 48 hours at 38°C. It was found that the extract of normal liver had a certain degree of antitoxic effect, which was diminished with extracts of liver infected with Echinococcus or Fasciola.

It was also found that the glycogen of the normal tissue was lowered by 76 to 56 per cent. in livers infested with Fasciola and from 61 to 39 per cent. in those containing cysts of Echinococcus. The importance of this is evident when one bears in mind the anti-infective and antitoxic functions of glycogen.

H. H. S.

FAUST (Ernest Carroll). **Notes on Larval Flukes from China. II. Studies on Some Larval Flukes from the Central and South Coast Provinces of China.**—*Amer. Jl. Hyg.* 1924. July. Vol. 4. No. 4. pp. 241–301. With 2 plates & 3 text figs. [64 refs.]

This valuable contribution to our knowledge of the morphology and classification of the larval flukes of China and Japan describes a number of new species and gives names to a large unbaptized series already recorded in Japanese literature. There is an interesting review also of the relationship existing between the distribution of the molluscan hosts of the Sino-Japanese areas and the important fluke infections. Thus *Melania* spp. are related to Paragonimiasis, *Bythinia* spp. to Clonorchiasis, *Onchomelania* spp. to Schistosomiasis and the *Planorbidae* to Fasciolopsis. In the vicinity of Shaohsing human infection with *Clonorchis sinensis* is unknown, but 100 per cent. of the cats are infected and the *Melania hongkongensis* is the intermediary mollusc, while the encysted cercariae occur on many fishes not only of the family Cyprinidae but also on species of Percidae, Centrarchidae and Umbridae.

R. T. L.

DEKESTER (M.). **Un cas de distomatose sous-cutanée au Maroc.**—*Ann. Parasit. Humaine et Comparée.* 1924. Oct. Vol. 2. No. 4. pp. 322–324. [7 refs.]

A man of 40 years presented himself at the hospital in Fès with a swelling some 12 cm. in length in the lower right iliac region of the abdomen, slightly inflamed, itching, and, at times, painful, with a small scab at one end. Blood expressed on removal of the scab showed a large number of eosinophiles, one to every three leucocytes, but the peripheral blood showed no excess. The swelling proved to be due to an immature specimen of *Fasciola hepatica.* The author suggests that the cercaria may at times enter by way of the skin.

H. H. S.

SUZUKI (Sotowo). **On an Inquiry into the Conditions of the Spread** of *Fasciolopsis buski.*—*Taiwan Igakkai Zasshi* (*Jl. Med. Assoc. Formosa*). 1924. May. No. 234. In Japanese. pp. 77–83. [English summary p. 6.]

Pigs are heavily infested with *Fasciolopsis buski* in those areas of Formosa where the water-chestnut is extensively grown. In the province of Takkao 29·9 per cent. are infected, while in that of Saersho, which is the principal place of cultivation, the extent of infection reached 60 per cent. So far no case of infection has been recorded from the inhabitants.

R. T. L.

ANDO (Akira) & TSUYUKI (Hiroshi). **[On the Endemic of Pulmonary Distomiasis in Tokigun, Gifu Prefecture.]**—*Iji-Shimbun* (*Med. News*). 1924. Mar. No. 1136. [Summarized in *Japan Med. World.* 1924. May 15. Vol. 4. No. 5. pp. 120–121.]

A few instances of Paragonimus infection were met with in Tokigun, but, though 1,214 fresh-water crabs were examined, only two were infected and no snail infection could be found. It is concluded that the origin of the human cases was situated in the neighbouring heavily infested district of Kadigun.

H. H. S.

FUNAKI (Hideharu). **[On the Influence of Bayer No. 205 on the Eggs of Lung Distome.]**—*Iji-Shimbun* (*Med. News*). 1924. Jan. No. 1131. [Summarized in *Japan Med. World.* 1924. Mar. 15. Vol. 4. No. 3. pp. 70-71.]

The author considers that the effects of Bayer 205 on the very few cases of paragonomiasis for which he had sufficient of the drug available were very promising. The eggs appeared to have a changed form as a result of the treatment. [Dosage used is not stated.]

R. T. L.

MOORE (Dunlop). **Note on the Longevity of** *Clonorchis sinensis.*—*Public Health Rep.* 1924. July 25. Vol. 39. No. 30. pp. 1802–1803.

More than 90 per cent. of Chinese immigrants on arrival at San Francisco are found infected with helminths—clonorchis, ascaris, trichuris, ankylostome, and others. After long residence out of Asia the clonorchis infection is found to persist, although the others disappear. In this note mention is made of persons continuing to pass ova of *Clonorchis sinensis* after long periods of uninterrupted residence in Central America, in one case as long as 20 years, while another had lived in Costa Rica continuously for 25 years, never revisiting China or any part of Asia, but still retained his infection with clonorchis.

H. H. S.

CH'EN PANG. **A Comparative Study of** *Clonorchis sinensis* **(Cobbold).**—*Far Eastern Assoc. Trop. Med. Trans. Fifth Biennial Congress, Singapore,* 1923. pp. 434–446. With 2 charts & 35 figs. [13 refs.]

LOOSS considered that two species of the genus Clonorchis inhabited man, but this view was not accepted by other workers. The author has examined in detail material from man, domestic cat, wild cat, dog, marten and badger and gives numerous measurements and other grounds in support of his conclusion that the *Clonorchis sinensis* is relatively variable, even in one host. Although there are differences in size, there are no constant specific differences in internal anatomy. All the specimens appeared to belong to one species.

R. T. L.

WAYSON (N. E.). **Spontaneous Hatching of Clonorchis Ova. A Preliminary Note on the Investigation to determine whether Clonorchiasis may be disseminated on the Pacific Slope.**—*Public Health Rep.* 1924. Apr. 25. Vol. 39. No. 17. pp. 861–862. [4 refs.]

The eggs of *Clonorchis sinensis* were kept in tapwater at room temperature varying from 14° to 20° C. At the end of five weeks the eggs were intact. On exposure to running filtered water at 24° to 26° C. the embryos began to escape. [Details of the investigations to determine whether clonorchiasis may be disseminated on the Pacific Slope referred to in the title are merely promised in the text.]

R. T. L.

ANDO (Akira) & KOBORI (Kotaro). **[On the Unnatural Route of Infection of** *Clonorchis sinensis* **(I Communication).]**—*Chugai Iji Shimpo* (*Central Med. Jl.*). 1924. May. Vol. 43. No. 9. [Summarized in *Japan Med. World.* 1924. Aug. 15. Vol. 4. No. 8. p. 202.]

By feeding fish containing encysted cercariae of *Clonorchis sinensis* to dogs and rabbits large numbers of free larvae were obtained. These could not survive in artificial gastric juice nor could infection be induced by feeding them to rabbits and albino rats. Attempts to infect a bird by feeding with fish containing the encysted larvae also failed.

R. T. L.

SOTO (Jaquin). **[Primo caso de distomatosis encontrado en El Salvador.]** —*La Clinica.* San Salvador. 1922. Vol. 1. Pt. 6. No. 5, 6, 7. [Summarized in *Arch. f. Schiffs- u. Trop.-Hyg.* 1924. May. Vol. 28. No. 5. p. 219.]

The title is misleading, as this first case of distomatosis met with in El Salvador was one of *Clonorchis sinensis* in a Chinaman.

R. T. L.

NISHIGORI (Masao). **On a New Species of Fluke,** *Stamnosoma formosanum,* **and its Life-History.**—*Taiwan Igakkai Zasshi* (*Jl. Med. Assoc. Formosa*). 1924. May. No. 234. In Japanese pp. 1–48. With 2 plates & 1 chart. English summary pp. 1–3.

From the gills of several species of freshwater fishes from the neighbourhood of Taihoku City the author obtained encysted cercariae which in experimental animals developed into *Stamnosoma formosanum* n.sp., the egg of which has some resemblance to those of *Clonorchis sinensis*, *Metagonimus yokogawai* and Heterophyes. The adult worm has been found as a natural infection in the night-heron but can probably be experimentally reared in cats, dogs, rats, rabbits, guineapigs, and has been successfully developed in man. The first intermediary is a Melania.

R. T. L.

DAY (H. B.). **The Etiology of Egyptian Splenomegaly and Hepatic Cirrhosis.**—*Trans. Roy. Soc. Trop. Med. & Hyg.* 1924. June 19. Vol. 18. No. 3. pp. 121–130. With 8 figs. [5 refs.]

The question of Egyptian splenomegaly and hepatic cirrhosis has long been a puzzle, and this paper is an interesting survey of the condition and its pathogeny as known at present. The early symptoms are often indefinite, though some 16 per cent. of patients give a history of diarrhoea at the onset of illness. By the time the patient comes under observation the liver and spleen are enlarged, firm and, perhaps, tender, while general symptoms of anaemia, loss of weight and recurrent attacks of fever are usually in evidence. Splenectomy in certain cases effected a marked improvement, but no explanation was forthcoming. More recently investigations were undertaken to determine the incidence and nature of bilharzial cirrhosis, and an extraordinary prevalence of enlarged cirrhotic livers and spleens was noticed among the patients examined, but those showing the cirrhosis most did not reveal signs of advanced bilharzial disease ; in fact, ova in the faeces might be few or absent. The author then advised that splenectomy should be performed on such patients and that at the operation a small portion of the liver should be excised for microscopical examination. This was done, and in each of five cases to date the characteristic ova have been found. If the disease has existed for a long time the ova may not be seen. In the part of the paper dealing with the pathology explanation is given of the failure to find ova in old-standing cases and of the causation of the two different types of cirrhosis found. The ova wander in the liver tissue leaving a trail of destruction with subsequent inflammatory reaction ; giant-cell formation occurs in the new connective tissue and the ova are completely enveloped and in time the majority disappear. The type of cirrhosis apparently depends on the number and rate of deposition of the ova. If, as is more usual, the numbers are small and deposited over a considerable period, the diffuse form of cirrhosis (multilobular) is set up ; if very numerous, they accumulate round the portal vessels, producing dense periportal (pipe-stem) fibrosis.

Enlargement of the spleen is an early symptom and often transient in *S. haematobium* infection, but progressive and lasting when accompanying the hepatic lesions of *S. mansoni* ; and we must now recognize that in the latter, particularly, the symptoms of peripheral inflammation may be subordinate to progressive disease of the central viscera, in other words, " progressive enlargement and cirrhosis of the liver with splenomegaly occurs in patients with chronic and often slight intestinal bilharziasis."

H. H. S.

DYE (William H.). **Schistosomiasis and Splenomegaly in Central Africa.** *Jl. Roy. Army Med. Corps.* 1924. Sept. Vol. 43. No. 3. pp. 161–181. With 15 text figs. [2 refs.]

This paper is an interesting and valuable contribution, not only to the solution of the problem of splenomegaly but also to the question of schistosomiasis generally in Central Africa. Topographical conditions are first briefly described and show how readily infection of molluscs by miracidia and of the inhabitants by cercariae is maintained. Next follows an account of the various molluscs indigenous to the district which might serve as intermediate hosts of schistosomes ; experimental work led to the conclusion that the only intermediate host of *S. mansoni* is *Planorbis* sp. near *sudanicus*, Martens, and the natural intermediate host of *S. haematobium* is *Melania nodocincta*, Dohrn. The latter schistosome is present only as a slight infection, but the former is exceptionally severe in children and young adults owing to their habit of visiting the same place for defaecation and being thus constantly reinfected. *S. mansoni* infection is, therefore, the more important and is associated with great enlargement of the liver and spleen, but without anaemia. The author was, unfortunately, able to obtain permission for only one limited autopsy, but sections of the liver showed lateral-spined ova in enormous numbers ; the spleen, however, showed none. Examination of those living in the surrounding villages demonstrated that the incidence of splenomegaly depended on the proximity to the breeding places of the molluscan hosts of the schistosome. Treatment by tartar emetic was carried out. Rectal administration, even in doses of 16 gr., led to temporary improvement only and had to be abandoned. Intravenously administered it brought about good results except in the later stages of the disease, when not only was there no improvement but the patients proved less tolerant of the drug.

In an appendix to the main paper a series of experiments is described to show the action of tartar emetic on the ova, miracidia and cercariae of *S. haematobium*. Their powers of resistance proved in this descending order and the parent worm, judging from clinical evidence, is probably least resistant of all.

H. H. S.

HODSON (V. S.). **Splenomegaly.**—*Jl. Trop. Med. & Hyg.* 1924. Sept. 15. Vol. 27. No. 18. p. 247.

A native boy was admitted to the Omdurman Civil Hospital with a spleen extending to 4 inches below the costal margin. As there was a history of recent fever quinine was given without effect on the spleen. Examination of the faeces showed ova of *S. mansoni* and treatment by tartar emetic was undertaken. Twelve months after admission the spleen had receded to ½ inch below the costal margin.

H. H. S.

BLACKLOCK (D. B.) & THOMPSON (M. G.). **Human Schistosomiasis due to** *S. haematobium* **in Sierra Leone.**—*Ann. Trop. Med. & Parasit.* 1924. Aug. 2. Vol. 18. No. 2. pp. 211–234. With 1 plate & 4 text figs. [12 refs.]

This paper may be regarded as an addendum to a Report submitted to the Government of Sierra Leone relative to the prevalence of human schistosomiasis in the Protectorate. It deals first with a description of the cercaria of *S. haematobium*, the only type of the disease met with there. The measurements of the cercariae are shown to be of little value, the difference between the living and the dead being very marked, and also among the latter the variations are considerable, according to the nature of the fixing fluid. Next, the differential characters of the cercariae of the human schistosomes are briefly considered. The evidence on which the cercariae from Sierra Leone are identified as those of *S. haematobium* comprises : 1. The finding of only terminal-spined ova in the infected population. 2. Experimental infection of Physopsis with miracidia from terminal-spined ova and subsequent infection of a monkey with cercariae from one of these snails. 3. The incidence of infection of the Physopsis was found to be high, 42 per cent. in one water latrine. 4. Adult males, morphologically identical with *S. haematobium*, were recovered three months after experimental infection of guineapigs and monkeys.

Some interesting facts relative to the bionomics of Physopsis are given, showing that it is a mud and sewage snail, particularly the latter, so that proper latrine accommodation would probably result in a marked reduction of human infection. Also, it was found that the snail could survive for 14 days in mud in the shade when the water was gradually drained away. Cutting off the water for a few days in the infected areas, therefore, would have but little effect on the human incidence-rate.

H. H. S.

SHARP (N. A. Dyce). **Schistosomiasis in Nigeria.**—*Jl. Trop. Med. & Hyg.* 1924. Sept. 15. Vol. 27. No. 18. p. 247.

Amoebic dysentery is said to be common in Nigeria, but the majority of patients presenting themselves with symptoms of passage of blood and mucus in the stools proved to be cases of rectal schistosomiasis.

Also, when examining faeces for incidence of ankylostomiasis, the author found ova of *S. mansoni* in 4 per cent. of apparently healthy prisoners. A short course of emetine and magnesium sulphate clears up the symptoms temporarily, but intravenous injections of tartar emetic bring about a cure after a total of 15–25 gr. has been administered.

H. H. S.

DE ALMEIDA (Elpidio). **A eschistosomose mansonica na Parahyba.**—*Brazil Medico.* 1924. May 31. Year 38. Vol. 1. No. 22. pp. 307–308.

More than six years ago the author directed attention to the prevalence of *Schistosoma mansoni* in the country, some of the northern States showing over 30 per cent. infection. Little if anything remedial has been done, with the result that in Parahyba there is heavy infection, particularly in three large foci, namely Guarabira, in which nearly all the inhabitants live near the dam and the majority are carriers of infection; Alagõa Grande, where the margins of the lagoon close to the town are swarming with *Planorbis centrimetralis*; and Campina Grande. The dwellings are not provided with latrines and the faeces are deposited in the water and nearly all the snails are infected. Dissemination is favoured by the warm climate.

H. H. S.

BLACKLOCK (B.) & THOMPSON (M. G.). **Observations on the Classification of Certain Schistosome Cercariae.**—*Ann. Trop. Med. & Parasit.* 1924. Aug. 2. Vol. 18. No. 2. pp. 235–237. [4 refs.]

The authors note an obvious misprint in the legend to one of the figures of *S. mansoni* in KHALIL'S paper on the morphology of *S. mansoni* [this *Bulletin*, Vol. 20, p. 220], where the name *S. haematobium* appears by mistake. They draw attention to the fact that the most recent studies of *S. haematobium*, *S. mansoni* and *Cercaria indica* XXX disclose no constant morphological character nor staining reaction by which they can be singly distinguished, nor does separation appear possible by means of intermediate hosts on present knowledge, for we do not know if *S. haematobium* can parasitize *Oncomelania* nor if *S. japonicum* can develop in *Planorbis* or *Bullinus* spp.

R. T. L.

FAUST (Ernest Carroll). **The Reactions of the Miracidia of** *Schistosoma japonicum* **and** *S. haematobium* **in the Presence of their Intermediate Hosts.**—*Jl. Parasit.* 1924. June. Vol. 10. No. 4. pp. 199–204. With 1 plate. [5 refs.]

Whereas the freeswimming miracidia of *S. japonicum* move about in the top stratum of water and thus only attack those molluscs in this layer, the miracidia of *S. haematobium* are equally distributed throughout the water in which they are hatched and are thus liable to attack all the snails in the immediate vicinity. This difference is an adaptation to the habits of the different intermediate hosts. On the ground of host relationship the author discards SEWELL'S suggestion that the cercaria found by him in a Planorbid in Calcutta was probably the larva of *S. japonicum*. The attraction of the mollusc for the miracidium is a chemotactic phenomenon and lies in the mucous secretion. Although the host-parasite mechanism is based on a precise adjustment, the miracidium is capable of a very wide accommodation as regards temperature and H-ion concentration.

R. T. L.

BETTENCOURT (A.). **Action de l'eau savonneuse sur le miracidium et la cercaire du** *Schistosoma haematobium*.—*C. R. Soc. Biol.* 1924. June 27. Vol. 91. No. 22. pp. 226–230. [4 refs.]

CONNOR and ANDERSON have noted the lethal action of soapy water on the bilharzia miracidium, but this is not in accord with the known facts regarding the spread of the disease at Tavira. Here the water contains mineral salts which precipitate soap and render it more or less innocuous. Laboratory experiments are detailed which show that soap does markedly affect the miracidia, but that this action is lessened by mineral salts ; the soap in the waters at Tavira does not attain the strength used in experiments and this explains the infestation of the intermediate hosts there. In soapy solutions of 2, 1 and 0·5 per 1,000 the cercaria survives from 2 hours 5 minutes to 3 hours 30 minutes, a shorter period than normal but more than sufficient to allow the organism to penetrate the definite hosts.

R. T. L.

CHRISTOPHERSON (J. B.). **The Prophylactic Treatment of Bilharzia Disease.**—*S. African Med. Rec.* 1924. July 26. Vol. 22. No. 14. pp. 335–337.

The ideal prophylaxis of the disease bilharziasis would be to attack the parasite at all four periods of its life cycle at the same time. (1) The *worm* in the human host; by antimony. (2) The *snail*; by destruction methods. (3) The *cercaria*; by the application of sound hygienic principles. (4) The *ovum* (in faeces and urine) ; by the adoption of healthy sanitary regulations. Bilharzia could be banished from a restricted focus like Santa Luzia (Tavira) in Portugal in a month or two.

The author gives reasons for advocating the use of tartar emetic in attacking the infection in Egypt. " The Mohammedan urinates and defaecates near water to carry out *Koranic law*, and uses the water for ablutions. . . . The snails are very widely distributed, and, although readily destroyed by desiccation, easily re-establish themselves, recruited from the inexhaustible Nile."

R. T. L.

CHRISTOPHERSON (J. B.). **The Prophylactic Treatment of Bilharzia Disease (Schistosomiasis).**—*Jl. State Med.* 1924. Aug. Vol. 32. No. 8. pp. 367–381. [20 refs.]

An interestingly written summary of modern knowledge as to prophylaxis of schistosomiasis, showing how the cycle of development of the worm may be broken and how the same measures will not be equally successful in all places owing to religious prejudice, insanitary practices, agricultural customs, and, in the case of *S. japonicum*, the existence of reservoir hosts. Efficient treatment of patients with tartar emetic injections naturally occupies an important position in prophylaxis.

H. H. S.

CHRISTOPHERSON (J. B.). **The Treatment of Bilharzia Disease.**—*Lancet.* 1924. May 24. pp. 1071–1072.

This article gives very clearly the details of the modern treatment of bilharziasis. The technique of intravenous administration of antimony tartrate is described minutely, together with an account of the contra-indications to the employment of the drug and of the signs of intolerance. Treatment should not be given to all cases indiscriminately; general debility, from whatever cause, and serious cardiac and renal disease contraindicate its use. Emetine, given also intravenously, comes second to antimony, in doses of 1½ gr. fifteen to twenty times in 6–8 weeks. Not only is it less effective, however, but there are risks of cardiac trouble and peripheral neuritis from the large doses which are needed. Unfortunately there are no laboratory tests to determine when sufficient antimony has been given. The best is the microscopic appearance of the ova passed, but this does not disclose the condition of the parent worm. Experience is, therefore, at present the only guide, and occasionally the worms have proved resistant to as much as 30 grains. When this is the case the injections should be suspended and a second course administered after an interval.

H. H. S.

SMITH (Norman Fairbanks). **Urinary Bilharziasis. A Campaign of Diagnosis and Treatment in Dongola Province, Sudan, November, 1921, to March, 1924.**—*Trans. Roy. Soc. Trop. Med. & Hyg.* 1924. Mar. 20 & May 15. Vol. 18. Nos. 1 & 2. pp. 50–56. [2 refs.]

During tours of inspection in the Dongola province the author and native Sudanese assistant medical officers administered ten thousand injections of tartar emetic to 740 cases of urinary bilharziasis. Of these, 520 were re-examined up to 2½ years after treatment and 5·4 per cent. were still found to be infected; 10 out of 28 had, however, abandoned treatment prematurely. Only 3·5 per cent. of those who received a full course are now infected. The possibility of the occurrence of antimony-resistant patients is suggested.

R. T. L.

CAWSTON (F. G.). **Treatment of Bilharziasis.** [Correspondence.]—*Brit. Med. Jl.* 1924. Aug. 16. p. 299.

The author has treated a large number of cases of schistosomiasis with intravenous injections of antimony. He finds that the potassium salt is less painful than the sodium and that less of the drug is needed. Whereas 20–30 gr. of the latter are required to bring about a cure, 18 gr. of the former is sufficient for adults, and for persons below the age of 18 years only one grain for each year of age is necessary. The injections were given over a period of 28 days, starting with ½ gr. and never exceeding 1½ gr. Although he has given over 1,700 injections in 5½ years he has seen no ill effects from the use of the drug. The curative dose of the potassium salt, he states, appears to be the same as that of emetine and, as the latter is administered intramuscularly, it may be employed in preference to antimony intravenously.

H. H. S.

LASBREY (F. O.) & COLEMAN (R. B.). **Treatment of Bilharziasis by Antimony Tartrate.**—*Brit. Med. Jl.* 1924. May 24. pp. 907–908.

The authors have treated by antimony tartrate intravenously 4,655 patients, since 1919, at the Church Missionary Society's Hospital, Old Cairo. For adult males the initial dose they give is a grain, increased by ½ gr. daily to a maximum of 2½ gr. Injections are given each day for six days, then on alternate days, to a total of 12 injections, or 27 gr. By this time only "dead" ova are found on repeated examination, and the patients are recorded as cured. In-patient treatment has proved more satisfactory than out-patient, and the mortality is now only 4·9 per mille. Patients with surgical complications receive some six injections prior to operation, and the subsequent improvement is much more rapid than when these are omitted.

H. H. S.

SCOTT (D. S.). **Treatment of Bilharziasis by Rectal and Vesical Injections of Tartar Emetic.**—*Tanganyika Territory Ann. Med. Rep. for the Year 1922.* (Appendix No. VII.) pp. 92–94.

The author has treated seven cases of schistosomiasis by means of tartar emetic administered rectally after a soap and water enema, or into the bladder after micturition. He now gives 20 gr. for a dose on alternate days, but to the first patient with *S. mansoni* infection 10, 15, and 20 gr. were given with a day's interval between, and the disease was apparently cured. Others were more refractory. To one was given in all 100 gr. per rectum, to another 100 gr. by the bladder, but ova still continued to pass. To the former was then administered two doses, each of 25 gr., by the bladder, to the latter the same doses per rectum, and in each case the ova disappeared. The patients were discharged as cured if no ova were seen in the urine examined on three successive days. [That this is not a safe criterion is evidenced by the fact that one patient is stated to have had a relapse after 16 days.]

H. H. S.

PETZETAKIS (M.). **Essai de traitement de la bilharziose par le chlorure de calcium en injections intraveineuses ou son association avec l'émétine ou le tartre stibié.**—*C. R. Soc. Biol.* 1924. June 27. Vol. 91. No. 22. pp. 159–162. [1 ref.]

For several months chloride of calcium has been used systematically in the treatment of a considerable number of cases of vesical bilharziasis at the Greek Hospital at Alexandria. Intravenous injections are given of a 10 per cent. solution in doses 0·5 to 1 gm. at a time daily for ten days and then every second day for ten additional doses. This procedure in cases with living eggs in the urine and slight cystitis gives excellent results and brings about the disappearance of the haematuria, a diminution in the number of eggs, and later their disappearance also in the bulk of cases. In old cases, where the eggs are calcified, and there is advanced cystitis with sanguino-purulent urine, the effects are less satisfactory and inconstant and in very advanced cases the drug is ineffective. These results are comparable with those obtained by emetine and tartar emetic, and the author recommends a combination of calcium chloride with these courses.

R. T. L.

CHRISTOPHERSON (J. B.). **Tartar Emetic in Bilharziasis.** [Correspondence.]—*Lancet.* 1924. June 7. p. 1184.

In this letter relative to priority in the employment of antimony intravenously in the treatment of schistosomiasis, the author directs attention to his article on the Antimony Treatment of Bilharziasis published in the *Journal of Tropical Medicine and Hygiene,* June 17th, 1923 [this *Bulletin,* Vol. 20, p. 943].

H. H. S.

MELENEY (Henry Edmund). **The Intermediate Host of** *Schistosoma japonicum* **in China. III. Further Observations on its Distribution.**—*China Med. Jl.* 1924. June. Vol. 38. No. 6. pp. 481–485. [3 refs.]

Further investigations have led to the discovery of *Oncomelania hupensis,* the intermediary of *S. japonicum,* on the shore of Tung T'ing Lake, in the region of Hankow, at Anking and at Pukow. Each locality was found to have its own epidemiological features and clinical cases of schistosomiasis. The seed-bed in which rice is sown is often the source of infection among the farmers. It is noted that the shells vary in different regions and that those from the Tung T'ing Lake are the largest and hardest, with the vertical ridges marked prominently, while below Hankow the shells become more frail. The shells from around Soochow have still smaller ridges and are in general trail and shorter. The slight markings upon the Japanese shells bear out the supposition that the two geographical species belong to the same genus.

R. T. L.

MELENEY (Henry Edmund) & WU (Hsien). **The Blood Serum Globulin in Schistosomiasis Japonica.**—*China Med. Jl.* 1924. May. Vol. 38. No. 5. pp. 357–361. [5 refs.]

A marked increase in blood-serum globulin has been shown to occur in active cases of kala azar. The authors have now shown that in infection by *S. japonicum* there is an equally high percentage of the globulin. For purposes of diagnosis, therefore, in districts where both these diseases are endemic, as in the Yangtse Valley, the globulin precipitation test needs to be very cautiously interpreted. It was found also that treatment of *S. japonicum* infection by tartar emetic led to a steady decrease in the intensity of the reaction, the result becoming negative with the disappearance of clinical symptoms. The test thus appears to constitute a valuable indication of the progress and success of treatment.

H. H. S.

STRUGNELL (L. F.). **Notes on Schistosomiasis in the Yangtse Valley.**—*Jl. Roy. Nav. Med. Service.* 1924. July. Vol. 10. No. 3. pp. 221–224. With 1 chart in text.

An account is given in some detail of two cases, on H.M.S. *Bee,* of infection by *Schistosoma japonicum* contracted on a shooting expedition in the Yangtse Valley. Exposure to infection occurred 43, 42 and 28 days prior to the onset of symptoms and, on the analogy of previous cases from the same district, the last was probably the actual day of infection. The onset of symptoms was fairly abrupt and the course of fever, lasting for some six weeks, was of the usual type. The primary rise of temperature is ascribed to "maturity of the parasite and the commencement of egg-laying" and the secondary rise, beginning on the 7th to 10th day, to "inflammation set up . . . by the general distribution of eggs and their lodgment in the various organs." The prognosis is good, since it is generally believed by Hankow practitioners that a single infection in a foreigner has not, as a rule, any sequelae.

H. H. S.

TOOTELL (George T.). **A Preliminary Survey of Schistosomiasis Infection in the Region of Changteh.**—*China Med. Jl.* 1924. Apr. Vol. 38. No. 4. pp. 270–274.

Laboratory records at Changteh, Hunan, for the past seven years have shown that 1 per cent. to 2 per cent. of all stools examined contain ova of *S. japonicum*, frequently accompanied by the ova of one or more intestinal parasites. The patients usually came from districts from 17 to 33 miles distant and a visit showed that the endemic centres were two. [For reasons which are not apparent, the author "names" the towns by alphabet only.]

R. T. L.

CULLEN (J. P.). **Case of Asiatic Schistosomiasis.**.—*Proc. Roy. Soc. Med.* (Sect. Trop. Dis. & Parasit.). 1924. Aug. Vol. 17. No. 10. pp. 85–86. [1 ref.]

As *Schistosoma japonicum* has not been reported west of Singapore the author publishes notes of a case in a Chinaman aged 40 admitted to Namtu Hospital, Burma, whose previous history, so far as could be ascertained, was that "he had lived in Namtu for 3 years; preceding that he had resided for an indefinite period in the frontier village of Myitkyina in the Northern Shan States, and before that in the Chinese Province of Yunnan, which borders on the Northern Shan States."

R. T. L.

SKINNER (A. H.). *Schistosoma japonicum*: **the Diagnosis of Early and Mild Infections.**—*Jl. Trop. Med. & Hyg.* 1924. May 15. Vol. 27. No. 10. p. 109. With 2 charts.

When infection with *S. japonicum* is slight and eggs are hard to find, "it is easy to rest content with a diagnosis of 'hepatitis' or 'paratyphoid,' where the symptoms are evidently abdominal and the fever is drawn out over a month or more." The clinical picture is really one of "subacute hepatitis." Clinical notes are given of two officers from one of H.M. gunboats who became infected while shooting at Tatung, on the Yangtse. The most important feature was liver tenderness, which with the blood picture and the type of temperature sufficed to settle the diagnosis.

R. T. L.

MELENEY (Henry Edmund). "*Schistosoma japonicum* **Infection in an American Child.**" **(Termination of Case first reported by Dr. Logan in 1911.)**—*China Med. Jl.* 1924. Apr. Vol. 38. No. 4. pp. 274–276. [2 refs.]

The subsequent history of a case of *S. japonicum* infection contracted in China, probably in 1908, is recorded. The patient had suffered at brief intervals from diarrhoea with the passage of mucus and blood.

In 1923, on account of an attack of acute abdominal pain in the right iliac region, laparotomy was performed and a gangrenous appendix found bound down by firm adhesions which were present throughout the whole abdominal cavity. There were also numerous calcareous deposits, about the size of a threepenny piece, scattered over the peritoneum. Death took place three weeks after the operation following two profuse haemorrhages from the bowel.

H. H. S.

LIBBY (W. E.). **A Further Study in Schistosomiasis Japonica.**—*China Med. Jl.* 1924. May. Vol. 38. No. 5. pp. 376–388. [1 ref.]

To a previous series the author adds notes of 18 cases of *S. japonicum* treated with tartar emetic. The ova disappear from the stool after from 4 to 10 grains. Cure is effected in mild cases and moderately severe cases improve. In severe cases, where there has been marked injury to the liver and spleen particularly, it will not stay the progress of the disease. If the drug is at all effective, this will appear when 20 grains in all have been given. The drug, from the author's experience, is more toxic than has been supposed. Beyond a total of 12 grains a lengthening of the intervals is recommended. Because the bulk of the cases come for help in the advanced stage, the author states that very little help can be expected in China from tartar emetic as a therapeutic agent.

R. T. L.

TOOTELL (George T.). **Tartar Emetic in Schistosomiasis Japonica.**—*China Med. Jl.* 1924. Apr. Vol. 38. No. 4. pp. 276–278.

The author treated with tartar emetic twenty-four patients suffering from Schistosomiasis japonica. The initial dose was, in most cases, 0·5 cc. of a 2 per cent. solution injected intravenously, increased, if no untoward symptoms arose, by 0·5 cc. daily till 5 cc. was given. When other intestinal parasites were present, these were dealt with first. Twelve were cured after an average stay in hospital of 38 days; 17 injections were found necessary. Seven improved; four who showed no amelioration did not continue the treatment for a sufficient length of time. One died of typhoid fever after being cured of his schistosome infection.

H. H. S.

KAWAMURA (Rinya), KAZAMA (Yoshiaki) TANAKA (Shyuji). **[On the Therapeutic Treatment of Schistomiasis Japonica.]**—*Saikingaku Zasshi* (*Jl. of Bact.*). 1924. Feb. Nos. 336 & 337. [Summarized in *Japan Med. World.* 1924. June 15. Vol. 4. No. 6. pp. 132–133.]

Experimenting with infected guineapigs, rabbits, dogs, goats and monkeys, it was found that X-rays inhibited the development of the genital glands of the bilharzia worms but did not affect the adults. Stibnal and silver salvarsan acted only slightly and salvarsan and neo-salvarsan not at all. As emetine hydrochloride gave promising results it was afterwards tested on 13 human cases. In the first six the faeces improved within 2 or 3 days in slight cases and in 21 days in the more severe cases. After 18–21 injections the faeces ceased to show eggs. A similar improvement was noticed in the second series. The authors consider that emetine hydrochloride should be given "in a minimal dose of 0·016–0·0186 cc. per kilogram body weight and maximal doses of 0·032–0·72 cc."

R. T. L.

KAWAMURA (Rinya), OHMORI (Chizuka) & TANAKA (Shyuji). **[Further Notice on the Emetin-Treatment of Schistosomiasis Japonica, together with a Note on the Influence of Emetin-Treatment on the Blood Features.]**—*Tokyo Ijishin-Shi (Tokyo Med. News).* 1924. June. No. 2374. [Summarized in *Japan Med. World.* 1924. Sept. 15. Vol. 4. No. 9. pp. 238–239.]

Emetine has the same action on human cases of Japanese schistosomiasis as it was previously shown to have on experimental animals. It ameliorated the symptoms as well as being an anthelmintic. With maximum doses, "2·91 cc.," no cases showed ill after-effects. In patients suffering from severe anaemia or heart disease smaller doses should be administered.

R. T. L.

MEGGITT (F. J.). **On the Collection and Examination of Tapeworms.**—*Parasitology.* 1924. July. Vol. 16. No. 3. pp. 266–268. [4 refs.]

The following method is recommended for collecting the smaller cestodes from the intestine. The gut is opened in short lengths of about 4 inches, and the piece removed and shaken in a flat dish filled with water at approximately 40°C. After being thus washed the intestine is removed to another similar dish and examined with a lens, and the adherent worms dissected out with needles. For rapid examination, placing in lactophenol is recommended, or clearing in clove oil after killing by immersion in hot absolute alcohol. Acetic acid carmine with 3 parts per cent. of saturated ferric acetate in glacial acetic acid is found to be the best stain for examining the genital organs, 5–30 minutes exposure to the stain, according to size, giving the best results.

For preservation the author prefers Zenker's fluid for not longer than 24 hours, with subsequent prolonged washing in running water. Bouin's fluid is not so satisfactory, and more washing is needed, but the material can be left in it for longer periods.

For permanent preparations Delafield's or Ehrlich's acid haematoxylin, or acetic alum carmine, have given equally good results.

H. H. S.

RILEY (William A.). *Diphyllobothrium latum* **in Minnesota.**—*Jl. Parasit.* 1924. June. Vol. 10. No. 4. pp. 188–190. [8 refs.]

In Minnesota human infection with *Dibothriocephalus latus* appears to be frequent. 14 cases have come under the observer's notice in 5 years. Of these 7 were recorded in 1919, the others are now published for the first time, bringing the total number of recorded cases for Minnesota to 65; a total quite out of proportion with that for Taenia. At least nine of the cases are definitely known to have been acquired locally.

R. T. L.

ANDERSON (T. B. H.). **Report of a Case of** *Dibothriocephalus latus* (*Diphyllobothrium latum*).—*Public Health Rep.* 1924. May 9. Vol. 39. No. 19. p. 1074.

A brief record of a Swede, aged 31 years, who died of phthisis and septic pneumonia in New Mexico, is made because the patient was harbouring ***Diphyllobothrium latum*****, a rare condition in the United States. The author believes that infection had been acquired in early life in Scandinavia.**

H. H. S.

MIYASHITA (Koho). **[On a Case of Parasitism of** *Diplogonoporus grandis* **Blanchard.]**—*Tokyo Iji-Shinshi* (*Tokyo Med. News*). 1924. Apr. No. 2363. [Summarized in *Japan Med. World.* 1924. July 15. Vol. 4. No. 7. p. 179.].

A sixth case of the rare parasite is recorded from man in Japan. The patient had eaten raw fish on occasion.

R. T. L.

MARJORIBANKS (R. M.) & LE SUEUR (Elizabeth J. O.). **A Case of** *Sparganum prolifer* **Infection. (Preliminary Note.)**—*Trans. Roy. Soc. Trop. Med. & Hyg.* 1924. Mar. 20 & May 15. Vol. 18. Nos. 1 & 2. p. 70.

A Chinese student age 22, who had been resident in Sarawak for ten months, is regarded as a patient suffering from this rare parasite, of which only two previous cases are on record. Symptoms of cough had been present for three months. The attacks occurred on alternate days, and during each two or three worms were coughed up. The larynx was normal, but with the laryngoscope a spongy patch could be detected below the left tonsil. This could be palpated and bits removed were found to contain small "Sparganum bodies." These varied in size from that of a pin's head to bodies 8 mm. bv 6·5 mm. They were mostly bean-shaped with prominences on one side. When fresh, the bodies were cream coloured and of the consistence of soft cheese. Microscopically the contents were found to consist of a white granular material with food vacuoles and oily globules.

R. T. L.

SHIMOMURA (Shiro). **[On the Destination of the Adult Worms of** *Sparganum mansoni,* **which had been introduced to the Animal Body by Non-peroral Route.]**—*Hifuka Kiyo* (*Arch. of Dermat.*). 1923. Nov. Vol. 2. No. 2. [Summarized in *Japan Med. World.* 1924. June 15. Vol. 4. No. 6. p. 134.]

Introduction per os of sparganum into rabbit, pig, guineapig, rat, chicken, pigeon and frog result in the development of adult forms. Their introduction into the urinary bladder, vagina, colon, similarly resulted in development into adult worms. The rabbit, which proved refractory to oral administration, proved similarly difficult to infect by non-oral routes, and even when adults were introduced into the stomach or intestine they did not survive.

R. T. L.

HILL (Rolla B.) & SANCHEZ (Augustin). **The Presence of** *Hymenolepis nana* **in Porto Rico.**—*Jl. Amer. Med. Assoc.* 1924. Sept. 6. Vol. 83. No. 10. p. 766.

Hymenolepis nana has not been recorded previously in Porto Rico. Among 47 inmates of the boys' orphan home in Hatillo, the eggs of this cestode were found in the stools of three ranging in age from 10 to 12. Carbon tetrachloride did not remove the parasites, but success followed the administration of oleoresin of aspidium 1 gm. in divided doses preceded for 24 hours by a milk diet and followed in two hours by magnesium sulphate.

R. T. L.

NANAVUTTY (Sohrab H.). **The Existence of** *Hymenolepis nana* **Infection in India.**—*Indian Jl Med. Res.* 1924. July. Vol. 12. No. 1. pp. 179–180. With 1 text fig.

This note deals with 2 cases of *H. nana* from Northern India. [The author erroneously states that this infection has not previously been described from India.]

R. T. L.

LUNEY (F. W.). **Cysticercus of** *Taenia solium* **in Human Brain.**—*Canadian Med. Assoc. Jl.* 1924. Feb. Vol. 14. No. 2. p. 143.

The case, briefly described, is of interest on account of the resemblance of the symptoms to those of "nervous syphilis." There were some illusions and hallucinations and complaints of electrical sensations in feet and hands. Neurological examinations gave the following:—

Ataxic; marked Rombergism; knee jerks greatly diminished, pupils sluggish to light and accommodation; paraesthesia of hands and feet; grip of right hand very weak. Latterly the patient had two epileptiform seizures with frothing at mouth and diffuse clonic convulsive movements on the right side, and he died some days later. At the autopsy one *Cysticercus cellulosæ* lay superficially beneath the arachnoid on the under surface of the right frontal lobe; flattened out; elongated and in apposition with optic nerves and right olfactory nerve; three other cysts were found in the subarachnoid space, deep in the sulci on the upper surface of the right cerebral hemisphere in front of the fissure of Rolando, and a fourth cyst occurred in the same region on the left side of the brain. After marriage the patient had a genital sore, but there was no subsequent history of secondary syphilis.

R. T. L.

MILLS (Ralph G.). **Notes on the Occurrence of** *Taenia solium* and *Cysticercus cellulosae* **in North China.**—*China Med. Jl.* 1924. June. Vol. 38. No. 6. pp. 465–471. With 1 fig. [6 refs.]

Three instances are recorded from North China of somatic taeniasis; two in pork and one in man. The history of human infection extended over at least twelve years.

R. T. L.

TRENTI (Enrico). **I metodi biologici nella diagnosi dell' echinococcosi umana. L'intradermoreazione precoce.**—*Policlinico.* Sez. Med. 1924. July 1. Vol. 31. No. 7. pp. 353–366. [25 refs.]

The author has carried out intracutaneous, subcutaneous and complement-fixation tests, noting the early and delayed reactions of the former, on 70 healthy persons and on 21 suffering from hydatid infection, in order to arrive at the value of each test and the relative values of the three for diagnostic purposes.

He finds that in persons free from hydatid the fluid obtained from human cysts, in quantities of 0·3 cc. injected intracutaneously, may give rise to a positive result; that with less than 0·3 cc. the results are negative, as they are also with 0·3 cc. of hydatid fluid from sheep. With definite hydatid cases 0·1 cc. of human fluid, similarly injected, gives a positive reaction in the majority of instances, 18 out of 21. As regards the other tests, the next in order of reliability is the subcutaneous, and the last is that of complement fixation, in which only half the cases proved positive. In one, in whom the complement fixation was positive and the intracutaneous negative, operation revealed a neoplasm of the liver, but no hydatid. [It is possible there may have been a cyst elsewhere, not discovered.]

H. H. S.

GOUDSMIT (J.). **Over de huidreactie bij echinococcusziekte.** [Skin Reaction in Hydatid Disease.]—*Nederl. Tijdschr. v. Geneesk.* 1924. Sept. 6. Year 68. 2nd Half. No. 10. pp. 1235–1240. With 1 text fig. & 1 plate. [7 refs.]

The author describes a case of hydatid in the lung which was diagnosed by the intradermo-reaction of Casoni, and its presence confirmed by X-ray photograph. Weinberg's reaction was positive in this patient.

The author compares this case with two others who were suffering from hydatid infection proved subsequently by operation. In one, Weinberg's reaction was negative, and in the other weakly positive. Both, however, gave positive results with the Casoni reaction. From this the author points out the advantages of the latter test, remarking on its simplicity, reliability and absence of any ill effects on the patient.

For preparing the antigen the author advises that the Echinococcus fluid be extracted from the cyst by means of a sterile syringe and placed in sterile tubes; it is allowed to stand at room temperature for 5–6 days, and is then carefully examined for the presence of bacilli. The fluid should remain clear and a preservative (1/2 per cent. carbol) may be added; turbidity, which is due to bacterial growth, renders the fluid unsuitable for the test.

A good skiograph is given.

R. T. L.

PORTER (F. J. W.). **A Unique Case of Hydatid of the Liver.**—*Indian Med. Gaz.* 1924. Sept. Vol. 59. No. 9. pp. 459–460.

There was a very large swelling of the abdomen in a male Hindu, aged 40, which was said to have begun 20 years previously. Amongst those who saw him chronic tubercular peritonitis was the favourite diagnosis. On incision under spinal analgesia a bucketful of daughter cysts was evacuated. The whole cyst was outside the peritoneal cavity. There was a large hole leading into a cavity in the liver which was lined in places with calcareous material. The cyst appeared also to have burrowed into the pelvis between the parietal peritoneum and the abdominal parietes. 72 days after the operation the wound had finally healed.

R. T. L.

KOSUGE (I.). **Wie weit wirken bei dem Eindringen von Strongyloideslarven und anderen parasitischen Nematoden in das Gewebe spezifische Reize?** [To what Extent do Specific Stimuli assist in the Penetration of Tissues by Strongyloides Larvae and other Parasitic Nematodes?]—*Arch. f. Schiffs- u. Trop.-Hyg.* 1924. May. Vol. 28. No. 5. pp. 179–187. [9 refs.]

The author carried out two groups of penetration experiments with Strongyloides and other larvae, with a view to deciding whether, and to what extent, such forces as thermotaxis and histotropism took part. (1) At room temperature, penetration occurred in one minute through thin blotting-paper, thick smooth blotting-paper, and Japanese paper, but not through thick note-paper. (2) Through a single layer of thin linen (handkerchief) they passed in half a minute, through a double layer in a minute. In each case the surface was moistened, and there was water on the under side. (3) With thin slices of uncooked potato there was no penetration, nor through plant leaves (*Fuchsia hybrida* and *Sparmannia africana*). (4) Penetration occurred after five minutes through a slice of apple 1mm. in thickness, but not through 2 mm. even after an hour.

A second group of experiments was performed with animal tissues. Histotropism is only advantageous when it takes place in a host in which development is to proceed further; in fact, this is histotropism in its proper sense. (1) Goodey's method was carried out in a fragment of frog's skin and also on the skin of a living frog at a temperature of 30°C. Larvae of Strongyloides were applied twice at an interval of 15 minutes, and after an hour the surface was carefully cleansed and 51 sections were made. In 19 of these larvae were found—6 in the epidermis, 27 in the upper corium, 10 in the lower layer, 7 at the junction of corium and the subcutaneous layer, and 6 in this layer itself. Larvae were also found in the stomach and lungs. (2) A guineapig was killed and left at room temperature for two hours. Larvea were then applied and the animal placed at 37°C. for five minutes. The larvae had penetrated to the subcutaneous tissue; in other words, they passed from the warmer atmosphere to the colder tissue, the reverse of thermotaxis. (3) Further experiments on the living mouse, and on tissue of the human umbilical cord, with larvae of *Strongyloides stercoralis* and Strongyloides from a monkey showed that these, and also the larvae of *Angiostomum nigrovenosum* from the frog, would penetrate the mouse's skin, but the author was unable to confirm Brumpt's hypothesis of a definite histotropism; in fact, he showed that even larvae of free-living nematodes would penetrate human umbilical tissue.

H. H. S.

HASEGAWA (Takuzo). [**On the Filarial Larvae of the** *Strongyloides stercoralis* **outside the Host's Body.**]—*Tokyo Ijishin-shi* (*Tokyo Med. News*). 1924. June. No. 2373. [Summarized in *Japan Med. World.* 1924. Sept. 15. Vol. 4. No. 9. p. 238.]

At a temperature of 7°–11° C. the rhabditiform larvae of Strongyloides metamorphose into the filariform stage in 24–30 hours after leaving the body of the host, while at 30°–37° C. they became free living mature forms in 25 to 37 hours.

R. T. L.

CILENTO (R. W.) & RICHARDS (R. E.). **Filariasis in Australia.**—*Med. Jl. Australia.* 1924. May 17. 11th Year. Vol. 1. No. 20. (Supplement) pp. 325–327.

As the result of a systematic examination for filarial infections in Australia it is noted that in Townsville there appears to be a seasonal variation in the prevalence of positive findings of microfilaria in the night blood, the percentage dropping considerably in winter. In the Lismore area of northern New South Wales filaria was not detected, and it is probably very mildly endemic if it exists now at all. In Brisbane 5·7 per cent. occurred in 877 examinations of both sexes and all ages. At Ipswich the rate was 3 per cent. At Maryborough 2·5 per cent. were positive, but here the rate rose to 4·6 per cent. when the hospitals and schools were included, giving a final figure of 3·8 per cent. for 105 persons. No case occurred in 26 slides at Gympie. At Bundaberg 3 cases were noted in 43 persons, but of these three only one had lived all his life there. At Rockhampton the rate was 3 per cent., while inland at Longreach and elsewhere no case occurred. In Proserpine 3·5 per cent. and Bowen 1·5 per cent. was noted. At Ayr the percentage was determined as 1·4. Practically speaking, the distribution of filariasis in Australia is confined to a narrow strip from the northern rivers of New South Wales to Cape York and including the south eastern corner of the Gulf of Carpentaria. The vector is *Culex fatigans.*

R. T. L.

CILENTO (R. W.). **Filariasis ; with Especial Reference to Australia and its Dependencies. A Review and Compilation.**—*Commonwealth of Australia Dept. of Health Service Publication (Tropical Division) No.* 4. [1923.] 78 pp. With 14 figs.

This " Service Publication " of the Department of Health of the Australia Commonwealth is described as a review and compilation, and, as such, provides in readily accessible form, for the assistance of medical practitioners in Australia and its tropical dependencies, a comprehensive summary of modern knowledge of " Filariasis " in its various manifestations as well as of the structure, life history of the *Filaria bancrofti* and of its vectors in those regions. [A number of useful illustrations are copied which in some cases lack due acknowledgment.]

R. T. L.

WALKER (Mavis J.). **Some Observations on the Transmission of** *Filaria bancrofti* **in Queensland.**—*Australian Jl. Experim. Biol. & Med. Sci.* 1924. June 16. Vol. 1. Pt. 2. pp. 39–45. With 7 figs. [3 refs.]

The four most abundant species of mosquitoes in Queensland are :—(1) *Culex quinquefasciatus* (=*fatigans*). (2) *C. annulirostris.* (3) *Aëdes vigilax.* (4) *A. aegypti* (=*Stegomyia fasciata*).

At first engorged mosquitoes were collected at random in Brisbane, but none was found infected. Experimentally *C. quinquefasciatus* was found to be a very efficient host and became infective in very hot weather 9½ days after feeding but usually after 11–16 days. In *C. annulirostris* partial development usually but exceptionally complete development occurred. *Aëdes vigilax* is inefficient and only partial development occurs, while in *Aëdes aegypti* no development could be induced.

R. T. L.

GUÉRIN (F. H.). **Enquête sur la filariose en Cochinchine.**—*Bull. Soc. Path. Exot.* 1924. May 14. Vol. 17. No. 5. pp. 397–405. [3 refs.]

Filarial infection is much more intense in Cochin-China than previous medical communications would lead one to suppose. The presence of large numbers of heavily infected Chinese, Hindus, Antilleans, etc. during the past fifteen years would appear to be responsible for this, combined with the high and even temperature which favours the larval development. The filarial index in 340 prostitutes examined in a two year investigation in Saigon is 4·7 per cent., a figure comparable to that obtained by MATHIS and LEGER for the inhabitants of the Tonkin Delta. The microfilariae are irregular in their appearance in the night-blood and in 10 out of the 16 positive cases obtained occurred in those in perfect health. Of the remaining 6, one had superficial lymphatic varices of the lower limbs with some elephantiasis of the labia majora; one had adenolymphocele; two had lymphangitis of the arm and forearm with swelling of the sub-epitrochlear gland; one had lymphangitis of the thigh, and one chyluria.

R. T. L.

LE CHUITON (F.). **Recherches sur l'épidémiologie de la filariose (*Filaria Bancrofti* Cobbold, 1877) en Cochinchine.**—*Bull. Soc. Path. Exot.* 1924. May 14. Vol. 17. No. 5. pp. 405–409. [2 refs.]

The filarial index of 84 sailors of the " Caserne des Marins " is 15·47 per cent. As the limits of variation of the temperature in Cochin-China are from 25° to 37°C. the author has experimentally ascertained if *Culex pipiens*, the most prevalent mosquito with Stegomyia, in Cochin-China served as host. In four series of experiments, viz., one at 27°, two at 35° and one at 37°C. the larva had reached the last stage of development at the end of ten days and 24 hours later could always be found in the proboscis. 27°C. appears to be the optimum temperature, and this is the average temperature of the different months of the year in Cochin-China, except in December and January, the coldest months, in which it is 25° to 26°C., and in April and May, the warmest, when it is 29°C. to 30°C.

R. T. L.

BÄR (H. G.). **Beschouwingen over de behandeling van Filariasis met tartarus emeticus, met beschrijving van een geval van vergiftiging.** [Remarks on the Treatment of Filariasis with Tartar Emetic with Description of a Case of Intoxication.]—*Geneesk. Tijdschr. v. Nederl.-Indië.* 1924. Vol. 64. No. 2. pp. 317–323. [6 refs.]

Bär reports favourable results of tartar emetic treatment of filariasis with doses not exceeding 100 mgm., controlled by observation on urine and subjective feeling of the patient. The acute attacks of lymphangitis with fever are either stopped or their frequency is much diminished by this treatment. A case of poisoning is described in a woman, aged 47, after 9 injections, containing together 755 mgm. tartar emetic (highest single dose 100 mgm.). The most marked symptoms were the sore mouth and an acute nephritis, with nearly complete anuria during 5 days. The patient recovered.

W. J. Bais.

CILENTO (R. W.) & O'NEILL (V. F.). **An Unusual Case of Filariasis with Post-Operative Tetanus.**—*Med. Jl. Australia.* 1924. May 10. 11th Year. Vol. 1. No. 19. pp. 462–464.

A woman, aged 30 years, suffered from elephantiasis of the right leg and exhibited also symptoms of chronic salpingitis and uterine misplacement. An operation was performed and filariasis of the broad ligament was found. Shortly afterwards an acute bronchitis supervened, which was treated, *inter alia*, by linseed-meal poultices. Some of the meal contaminated the operation wound. On the eighth day after operation signs of tetanus appeared, and the attack was a fairly severe one. The patient recovered in three weeks, having received in all 231,000 units of anti-tetanic serum, subcutaneously, intramuscularly, intravenously and intrathecally. The last route appeared to yield the best results. The linseed was regarded as the source of infection, since it came from India, "where tetanus is rife and where the conditions of its preparation are extremely insanitary."

H. H. S.

MATHESON (Farquhar). **Elephantiasis of the Arm.**—*New Zealand Med. Jl.* 1924. Aug. Vol. 23. No. 116. p. 331. With 1 plate.

A short account is given of elephantiasis of the right arm and leg of a Samoan woman, aged 36 years. The condition had been present for ten years but had increased rapidly during the last six. From the arm a mass weighing 43 lbs. was removed. There was no shock and healing was uneventful. A second case is referred to in which a man had so large an elephantoid mass that he "required the assistance of two men to carry his arm in a piece of sacking when he wished to walk."

H. H. S.

RODRIGUEZ RIVERO (P. D.). **[Contribución al estudio de la Elefantiasis arábiga en Venezuela.]**—*Tercer Congreso Venezolana de Medicina, Valencia* 23 *bis* 28 *Juni* 1921. Caracas 1921. Tipografia Americana. [Summarized in *Arch. f. Schiffs- u. Trop.-Hyg.* 1924. May. Vol. 28. No. 5. p. 213.]

The original paper is described in the summary as a detailed work on elephantiasis, its causes, operative treatment, etc. Chyluria, lymphocele, elephantiasis and other conditions ascribed to *Filaria bancrofti* are met with in Venezuela, but the embryos were not found even after prolonged search. These so-called "filarial conditions" are more correctly to be regarded as "filarial sequelae," the direct cause being bacterial infection. [The same point was insisted upon in the report of the Commission under Professor LEIPER sent from the London School of Tropical Medicine to British Guiana in 1921.]

H. H. S.

STENHOUSE (H. M.). **The Kondoleon Operation and Filariasis.**—*U.S. Nav. Med. Bull.* 1924. June. Vol. 20. No. 6. pp. 715–716. [4 refs.]

The author regards the absence of filaria embryos from the peripheral circulation in cases of elephantiasis as indicating the efficiency of nature's protective mechanism against them, and asks whether the protective wall should be broken down or new avenues opened up "by which injurious parasites might again enter the general circulation." He then goes on to say that he has performed Kondoleon's operation on several cases and is convinced of its beneficial effects and satisfactory results.

H. H. S.

BLANCHARD (M.) & LAIGRET (J.). **Recherches sur la transmission d'*Onchocerca volvulus* par divers parasites hématophages.**—*Bull. Soc. Path. Exot.* 1924. May 14. Vol. 17. No. 5. pp. 409–417. [4 refs.]

As " Filarial itch " does not occur in foci of intense infestations with *Onchocerca volvulus* in the Congo the theory that the life history of this parasite may resemble that of the guineaworm and that as a result of scratching the embryos may be liberated from the skin does not appeal to the authors. They have consequently experimented with numerous biting insects to discover the true intermediary. By these the embryos disseminated in the skin are taken up and with *Ornithodorus moubata* this is particularly the case. In *Cimex lectularius* the embryos are few and infrequent. No development occurred in any of the experiments. The authors consider that ticks are useful for obtaining the larvae from the skin and are less repugnant to the patient than the method of slicing off the skin surface, but the danger of conveying tickfever to the unfortunate subject cannot be ignored and such an accident followed one of the experiments recorded in the paper.

R. T. L.

FAIRLEY (N. Hamilton) & LISTON (W. Glen). **Studies in the Transmission of** *Dracunculus medinensis*—**a Negative Experiment. Part II.**—*Indian. Jl. Med. Res.* 1924. July. Vol. 12. No. 1. pp. 93–104. [18 refs.]

Until dracontiasis has been conveyed to man or animals by experimental methods on a larger scale, and with more uniform results than hitherto, the theory of Cyclops transmission can only be expressed in terms of high grade probability, according to the authors. In view of Liston's previous failures to infect *Macacus sinicus* with cyclops containing infective larva of the guineaworm a new series of 22 monkeys were exposed to infection. Experiments are detailed, showing the lethal effect of the alimentary secretions on Cyclops. Churning action of the bowel is considered necessary mechanically to release the larvae from confinement in the exoskeleton of the dead cyclops. The larvae survive in gastric juice and acid concentrations exceeding the normal over one hour; in alkaline media with trypsin the survival time is over seven hours. In either case it is long enough to ensure penetration of the mucosa. Exhaustive experiments calculated to secure the infection of *Macacus sinicus* proved abortive and the conclusion that this species is immune would appear to be well grounded.

R. T. L.

WRIGHT (R. E.). **Encysted Guinea-Worm of the Orbit.**—*Indian Med. Gaz.* 1924. Sept. Vol. 59. No. 9. pp. 458–459.

The author sent a specimen of an encysted worm, removed from the upper eyelid of a child in Madras, to the London School of Tropical Medicine, where it was identified as Dracunculus, and a suggestion was made that a brief record of the clinical aspect of the case would be interesting. The patient, a girl of 5 years, had left-sided ptosis, and a hard swelling in the lid, connected by a narrower part with another nodule situated posteriorly between the roof of the orbit and the eyeball. Incision was made and the degenerating coils, apparently partially calcareous, of an encysted worm were removed in two pieces, and the specimen forwarded to England.

H. H. S.

STEWART (H.). **X-Ray Photograph of a Guinea-Worm in the Popliteal Space.** [Correspondence.]—*Jl. Trop. Med. & Hyg.* 1924. May 15. Vol. 27. No. 10. p. 120. With 1 fig.

An excellent skiagram shews a calcified guineaworm in the popliteal space in a case clinically diagnosed as "chronic arthritis."

R. T. L.

LE ROY DES BARRES. **L'ascaridiose chirurgicale.**—*Far Eastern Assoc. Trop. Med. Trans. Fifth Biennial Congress, Singapore,* 1923. pp. 447–481.

This paper recounts the very varied lesions and symptoms which have confused the physician in the past and surprised the surgeon and which have been attributed to *Ascaris lumbricoides.* [It is highly regrettable that such a valuable résumé should lack a bibliography giving detailed references to the numerous sources of information quoted in the text.]

R. T. L.

FANCONI (G.). **Die Askariden als Krankheitserreger.**—*Schweiz. Med. Woch.* 1924. May 8. No. 19. pp. 434–437. [13 refs.]

Three cases are recorded by the author, together with two others taken from the literature, relative to disease associated with the presence of Ascarides in the body. The earlier symptoms produced are rise of temperature, catarrh, cough, bronchitis and, in some instances, urticaria with high eosinophilia. These are possibly due to the migration of larvae from the intestine *via* the blood stream to the lungs. After a varying interval much graver signs may appear. In the author's first case, a child of 16 months, there were acute vomiting and profuse diarrhoea, during which 450 ascarides were passed by the bowel, mouth and nose, and also meningitic symptoms—stupor, rigidity and opisthotonus (Pseudoméningite vermineuse of French authors). These later symptoms are due in part to mechanical irritation, in part to toxic products.

A brief summary is given of FLURY's analysis of the toxins obtained from Ascaris, and the author, by injecting subcutaneously 0·2 cc. of a watery extract of ascarides into a child of 12 years who several years previously had suffered from ascariasis, produced an urticarial erythema of the whole body surface. This symptom, therefore, is probably anaphylactic in nature.

H. H. S.

GARCIA (Carlos Lagos). **[Ascarid Ileus.]**—*Semana Méd.* Buenos Aires. 1924. Mar. 6. Vol. 1. p. 413. [Summarized in *Jl. Amer. Med. Assoc.* 1924. May 3. Vol. 82. No. 18. p. 1484.]

Bowel obstruction with masses of ascarids entails a particularly grave prognosis in young children. Fatal collapse from toxaemia may follow even prompt laparotomy. A girl aged 3 did not survive the extensive resection necessitated by the packing of the gut for 80 cm. by worms. In future the author proposes to suture the bowel, above the obstruction, to the skin and await recuperation from the shock before proceeding further.

R. T. L.

VERDELET (L.) & LACOUTURE (M.). **Occlusion intestinale d'origine ascaridienne.**—*Jl. Méd. de Bordeaux.* 1924. Sept. 10. Vol. 101. No. 17. p. 752.

A woman, 64 years of age, was admitted to hospital with symptoms of intestinal obstruction. On the following day 12 ascarides were vomited. She recovered on anthelmintic treatment without operation. The author states that in such cases there is usually a history of previous attacks of colic with passage of worms, that the obstruction is not absolute, pain is less in degree and less localized. He is of opinion that many of the symptoms are the result of " segmentary hyperperistalsis "—an intestinal spasm produced reflexly by the irritation of the worms.

H. H. S.

AMBERGER (J.). **Ein Fall von Askaridenobturationsileus mit mehrfacher sekundärer Darmperforation**—*Deut. Ztschr. f. Chirurg.* 1923. Dec. Vol. 183. No. 5–6. pp. 424–425. [1 ref.]

A young man, 17 years of age, was admitted to hospital with symptoms of appendicitis. At operation a large mass of Ascarides occupying the lower 20–25 cm. of the small intestine was found and 129 worms removed from an incision in the bowel wall. Several more were passed *per anum* during the succeeding 48 hours. An abscess developed at the site of the wound and more worms were removed. Repeated operations were performed subsequently owing to perforation by Ascarides passing, not through, but near the original opening in the bowel, the worms being found in the abdominal cavity. The patient died, but permission for autopsy could, unfortunately, not be obtained.

H. H. S.

STEWART (Quintin). **Discharge of** *Ascaris lumbricoides* **through a Herniotomy Wound.** [Correspondence.]—*Brit. Med. Jl.* 1924. July 19. pp. 103–104.

A native of Nigeria, aged 79 years, was operated upon for a strangulated inguinal hernia. Four days after the operation 3 adult *Ascaris lumbricoides* were removed from between the skin and muscle at the site of the incision, and the administration of santonin brought away many more in the evacuations. The worms must have made their way through a softened area in the intestinal wall after reduction of the strangulated bowel, the local adhesions fortunately preventing infection of the general peritoneal cavity.

H. H. S.

SCHINZ (Hans R.). **Askariden in Röntgenbild.**—*Deut. Ztschr. f. Chirurg.* 1924. Mar. Vol. 184. No. 1 2. pp. 105–109. With 3 text figs. [1 ref.]

A woman of 40 years who had previously been operated upon for appendicectomy and, later, for ileus, complained of pain situated mainly in the left lower quadrant of the abdomen. X-ray examination after a bismuth meal showed, by " worm-like absence of shadow," the presence of Ascarides, which were removed by administration of santonin and oil of chenopodium. Symptoms greatly improved but the pain did not entirely disappear and was probably due in part to some other cause, possibly tuberculosis of the mesenteric glands which were seen to be enlarged.

H. H. S.

HOLTHUSEN (Hermann). **Biologische Dosierung der Röntgenstrahlen mit Ascariseiern.**—*Klin. Woch.* 1924. Jan. 29. Vol. 3. No. 5. pp. 185–186. With 3 figs.

In this paper is described a method of testing the relative intensity of X-rays, using as indicator the percentage number of living ascaris ova which are injured by exposure to the rays.

H. H. S.

CRAM (Eloise B.). **The Influence of Low Temperatures and of Disinfectants on the Eggs of** *Ascaris lumbricoides.*—*Jl. Agric. Res.* Washington. 1924. Jan. 19. Vol. 27. No. 3. pp. 167–175. [11 refs.]

This paper contains much valuable information both from the purely scientific and from the economical aspects, but is probably of greater importance to the agriculturist and the veterinarian than to those engaged in human medicine. It is so condensed and full of facts that even a brief account of the experimental details would necessitate transcribing almost the whole. Little more than the conclusions, therefore, can be given here.

Fresh ova of *Ascaris lumbricoides* were found to be viable even after being kept for 40 days at a temperature of - 16° F., so that under natural conditions many would survive in pens, pastures, stables, etc., through a severe winter. Eggs in a later stage of development and containing embryos were killed by 20 days' exposure to the same temperature. As regards the influence of disinfectants, immersion in 5 per cent. carbolic acid solution for 10 hours, rendered fresh and partially developed eggs incapable of further growth, as did 3 per cent. cresol in 5 hours. "Under conditions as nearly analogous as possible to those in sanitary pens, in which pigs are kept, the efficacy of disinfectants was assured if the mixture of eggs and sawdust was thoroughly raked over and sprayed four times on each of two successive days." The proper cleaning, however, is regarded as a more useful and economical method of eliminating the eggs since the thoroughness of application which the experiments show to be necessary for disinfectants is not likely to be secured in practice, though phenol and cresol disinfectants may help to destroy Ascaris infection in pens and buildings under special conditions.

It is worthy of note that fresh ova were found to be more resistant to low temperatures than those containing active embryos, but that as regards resistance to disinfectants, the reverse appeared to be the case.

H. H. S.

BAKKER (C. R.). **Invloed van lage temperaturen op de eieren van** *Ascaris lumbricoides.* [Influence of Low Temperatures on the Eggs of *A. lumbricoides.*]—*Tijdschr. v. Vergelijkende Geneesk. enz.* Leyden. 1924. Sept. 10. Vol. 10. No. 4. pp. 275-281. English summary p. 280. [9 refs.]

The eggs used were obtained from the vagina and uteri of adult *Ascaris lumbricoides.* In eggs incubated on moist filter paper at 25°C., the first larvae appear in about a fortnight, and the majority in about three weeks. Eggs were then exposed for varying periods to low temperatures and the results noted after incubation at 25°C. The temperatures to which they were exposed were —15°C., —20·5°C., —25°C., —30°C., —60°C., —120°C., and —190°C. (liquid air), and at each of these the eggs were allowed to remain for 5, 10, 20, 40, 60 minutes and 24 hours, and at —15°C. also for 47½ hours. It was found that at temperatures from —30°C. downwards, exposure had a deadly effect on the eggs. —15°C. has no bad effects on the subsequent development of the eggs. After a week's exposure at —25°C. the eggs appear to have suffered no ill effects; exposure to this for longer periods, however, causes less and less eggs to develop when incubated later. Exposure to —20·5°C. causes less eggs to die than in those exposed to —25°C.

R. T. L.

WASSELL (C. McA.). **Development of Ascaris Eggs in Formaldehyde Solution.** [Correspondence.]—*China Med. Jl.* 1924. June. Vol. 38. No. 6. p. 529.

Ascaris eggs stored in a 10 per cent. solution of formalin for class purposes were found after three months to be embryonated and the living larvae escaped after pressure under a cover glass.

R. T. L.

TAKANO (Ryozo). **[Contributions to the Development of Ascarid Eggs. II Communication.]**—*Osaka Igakkwai Zasshi* (*Jl. Osaka Med. Soc.*). 1924. Mar. Vol. 23. No. 3. [Summarized in *Japan Med. World.* 1924. Aug. 15. Vol. 4. No. 8. p. 209.]

A previous opinion that ascaris eggs develop most favourably in an acid liquid is confirmed.

R. T. L.

ASADA (Junichi). **[An Experimental Study on the Biological Nature of the Larvae and Adult Forms of Ascaris in the Host's Body: especially on the Adult Ascaris found in the Abdominal Cavity of the Host.]**—*Tokyo Iji-Shinshi* (*Tokyo Med. News*). 1924. Mar. Nos. 2361 & 2362. [Summarized in *Japan Med. World.* 1924. July 15. Vol. 4. No. 7. pp. 178–179.]

Ascaris larvae never live long in the abdominal cavity, although adults survive for two weeks, but die within 18 days in experimental cases. While alive the females lay eggs in this situation. The dead worm causes severe reaction and nodules or abscesses might result. These experiments lead one to consider whether the adult worms found in the abdominal cavity in human cases may not have escaped from the intestine.

R. T. L.

ASADA (Junichi). **[On the Development of Ascarid Larvae in the Body of the Host. Especially on the Desquamation of the Ascarid Larvae and the Nourishing Substances for the Ascarid Larvae.]**—*Tokyo Iji-Shinshi* (*Tokyo Med. News*). 1924. Apr. No. 2366. [Summarized in *Japan Med. World.* 1924. July 15. Vol. 4. No. 7. p. 179.]

Within a short period after hatching the ascaris larva moults. In the lungs the larvae live a comparatively long time, and there or in the trachea undergo a second ecdysis and in the intestine two further moults take place. They feed upon the corpuscles, plasma and tissue juices.

R. T. L.

HIRAISHI (Sadaichi). **Some Experiments on the Growth of** *Oxyuris vermicularis.*—*Japan Med. World.* 1924. May 15. Vol. 4. No. 5. pp. 118–119.

The aim of this study was to determine whether larvae of Oxyuris after being ingested by mice migrate into the internal organs. At various periods after feeding the animals were killed, the abdominal and pleural cavities, the gastric and intestinal contents, were separately washed with salt solution and the fluid collected and centrifuged, and the various organs were ground up with saline and the resultant emulsion centrifuged, and the products examined. There was no migration detected in any of the experiments, but the matured larvae were found to hatch in the upper part of the small intestine in an hour or two, to pass down and collect in the lower part, while a few reached the large intestine. Living larvae may be found for at least five days, but in decreasing numbers.

H. H. S.

FISCHER (Walther). **Oxyuren und Appendicitis.**—*Deut. Ztschr. f. Chirurg.* 1923. Nov. Vol. 183. No. 3/4. pp. 222–245. [46 refs.]

The author examined the appendices taken post-mortem from 68 men and 37 women. Oxyuris was present in 19 of the former and 10 of the latter, or in 28 per cent. of the total. He holds, however, that the worm has but little etiological relation, probably none, to appendicitis. Among the reasons which he discusses are : firstly, that Oxyuris is rarely found in cases of acute appendicitis ; secondly, that one would expect more frequently to see involvement of the large intestine ; thirdly, that microscopical examination of appendices in cases of Oxyuris infection in the majority of instances shows no departure, histologically, from the normal. Lastly, the question of local eosinophilia is discussed very fully and the author concludes that it is not a point of much value in this respect. He found the condition even more marked in some cases of appendicitis where Oxyuris was absent, while, on the other hand, in many cases of Oxyuris infection eosinophilia was not present. He suggests that it may be merely a concomitant of digestive function, its presence and degree depending upon the time which has elapsed between the taking of food and removal of the viscus, and thus on the stage of the digestive process.

H. H. S.

JAROSCHKA (Karl). **Ueber Typhlitis und Appendicitis, verursacht durch Oxyuren.**—*Deut. Ztschr. f. Chirurg.* 1923. Nov. Vol. 183. No. 1/2. pp. 99–113. With 3 text figs. [41 refs.]

The question is discussed, largely by means of published statistical records, as to what extent Oxyuris, when associated with appendicitis, is definitely causative. Appendicular colic and the condition designated as " Appendicopathia oxyurica " are, as a rule, afebrile. The worm can penetrate an intact rectal mucous membrane and set up perirectal abscess. A case is recorded, in a child of 6 years, in whom such an abscess was found on incision to contain thin pus and a number of living specimens of Oxyuris. They were also present in the surrounding granulation tissue. In another instance, the details of which are given, a pericaecal swelling with marked local eosinophilia was associated with Oxyuris in considerable numbers.

H. H. S.

KRIMER (M.). **"Vermitacet," gegen** *Oxyuris vermicularis.*—*Deut. Med. Woch.* 1924. June 13. Vol. 50. No. 24. pp. 803–804.

" Vermitacet " is made from *Tanacetum vulgare,* L. (tansy), mixed with a mild purgative fruit-paste. The author has found it very effectual in the treatment of infections by *Oxyuris vermicularis.* The dose is not stated, but " a packet " suffices for an adult ; children are said to require a proportionately smaller quantity. It is given as a single dose in the morning. Of seven patients whose ages varied between 2½ and 48 years, six were cured by the one dose ; one, a woman of 32 years, required a second dose. The worms were sometimes living when passed and the author recommends frequent washing of the perineum and buttocks with cold water, night and morning and after each act of defaecation.

H. H. S.

WEINBERGER. **Eine einfache und zuverlässige Oxyurenbehandlung.** [A Simple and Reliable Treatment of Oxyuriasis.]—*Med. Klin.* 1924. June 1. Vol. 20. No. 22. p. 750.

The author, after trying in vain all the usual treatments for eradication of Oxyuris, found rectal injection of Chloramin effectual. This is a white powder which, when dissolved in water, has a strong smell of chlorine. A purgative is administered in the morning, and in the evening half a litre of warm water containing 1–2 tablespoonfuls of chloramin solution, 20 in 250, is injected into the rectum. This treatment is carried out daily for five or six days and repeated after an interval of 8–9 days. The fluid at first causes considerable irritation and can be retained for about two minutes only, but soon it can be borne for as long as 10–20 minutes. Thirteen cases, both children and adults, have been now successfully treated by the author in this way, some of them after failure with the usual methods. Care must, of course, be taken, by washing of hands and buttocks, to avoid reinfection.

H. H. S.

BRÜNING (H.). **Kurze Bemerkungen zu den Aufsatze von Herrn Dr. Weinberger ueber "Eine einfache und zuverlässige Oxyurenbehandlung."** (Nr. 22 dieser Wochenschrift.)—*Med. Klin.* 1924. July 20. Vol. 20. No. 29. (1023). pp. 1001.

The author writes objecting to the description by Dr. WEINBERGER of his treatment of Oxyuris infection by chloramin as "simple and reliable." He maintains that a method involving repeated rectal injections, careful washing of hands and buttocks, attention to the finger-nails, the wearing of bathing-drawers at night, and a repetition of the whole process after an interval of 8 or 9 days cannot be properly regarded as "simple," while as to its reliability sufficient time has not been allowed to elapse to warrant such a pronouncement.

H. H. S.

NISHIWO (Tsunenori). **[Studies on Oxyuris.]**—*Chiba Igakkwai Zasshi* (*Jl. Chiba Med. Soc.*). 1914. Mar. Vol. 2. No. 2. [Summarized in *Japan Med. World.* 1924. Aug. 15. Vol. 4. No. 8. p. 205.]

From a detailed study of the development of the Oxyuris of the rat it is concluded that a second host is unnecessary for the completion of the life cycle and that no migration is essential from the intestine to other organs of the host for complete development.

R. T. L.

HASEGAWA (T.). **Beitrag zur Entwicklung von Trichozephalus in Wirte.**—*Arch. f. Schiffs- u. Trop.-Hyg.* 1924. Aug. Vol. 28. No. 8. pp. 337–340. With 4 figs.

The author carried out experimental work with human Trichuris on white rats, and with *T. depressiusculus* on puppies. He found that 20 hours after feeding the rats with ripe ova of *T. trichiura* the larvae had escaped and penetrated the villi of the intestine, especially the caecum. In the case of *T. depressiusculus* similar penetration took place, and the larvae remained in the mucosa for two days. In

70 hours or thereabouts after being ingested, they passed again from the villi to the lumen. They never penetrated deeper into the submucosa, but remained coiled in the neighbourhood of the Lieberkühn glands, the cells of which were destroyed. Ova began to appear again in the faeces 36 days after the initial feeding.

H. H. S.

HASEGAWA (Tokuzo). [**On Some Observation on the Development of** *Oxyuris vermicularis*.]—*Tokyo Ijishinshi* (*Tokyo Med. News*). 1924. May. No. 2367. [Summarized in *Japan Med. World*. 1924. Aug. 15. Vol. 4. No. 8. p. 203.]

Mature eggs in the female did not develop at 28–30° C., but at 30°, with adequate moisture, they hatched on the sixth day of incubation. The larvae would reach the stomach and intestines of fed animals in 2½ hours and could be found lodged in Lieberkühn's crypts. They did not pass through the liver and lungs before infesting the intestines as in the cases of Ascaris and the ankylostomes.

R. T. L.

LEIVA (Lamberto). **The Common Whipworm** (*Trichuris trichiura*) **as a Health Hazard.**—*Jl. Philippine Islands Med. Assoc.* 1924. June. Vol. 4. No. 6. pp. 223–227. With 3 figs. [7 refs.]

Trichuris trichiura is a prevalent worm in the Philippine Islands, and the author, without wishing to pose as alarmist, calls attention to its presence as a dangerous worm penetrating the mucosa and possibly opening the way for other infections either bacterial or protozoal.

R. T. L.

DIECKMANN (A.). [**Operations for Intestinal Parasites.**]—*Beiträge z. Klin. Chirurg.* Tübingen. 1924. Vol. 131. p. 373. [Summarized in *Jl. Amer. Med. Assoc.* 1924. May 24. Vol. 82. No. 21. p. 1739.]

A man, aged 46, who had suffered from haemorrhage from the bowel for several weeks, accompanied by emaciation, was submitted to operation. The condition was ascribed to enormous numbers of *Trichuris trichiura* in the ileum and ascending colon, a two-litre dish being filled with those removed. He died soon afterwards of thrombosis of the inferior vena cava and renal veins.

H. H. S.

DIVE (G. H.) & LAFRENAIS (H. M.). **A Case of Deposition of the Eggs of** ***Hepaticola hepatica*** **in the Human Liver. With a Note on the Identity of the Eggs.** By MACARTHUR (W. P.).—*Jl. Roy. Army Med. Corps.* 1924. July. Vol. 43. No. 1. pp. 1–4. With 4 figs. [9 refs.]

MACARTHUR (W. P.). **A Case of Infestation of Human Liver with** *Hepaticola hepatica* **(Bancroft, 1893) Hall, 1916; with Sections from the Liver.**—*Proc. Roy. Soc. Med.* (Sect. Trop. Dis. & Parasit.) 1924. Aug. Vol. 17. No. 10. pp. 83–84.

At the post-mortem on a British soldier, aged 20, who had served 3 years in India and had died with clinical symptoms chiefly of septic pneumonia, a number of abscesses were found widely scattered in both lungs and in the liver. In proximity to the liver abscess were found, microscopically, masses of eggs identified by MacArthur as those of ***Hepaticola hepatica*** (a trichurid parasite common in the liver of the rat but not hitherto recorded for man.)

The liver tissue is carefully described and well illustrated in a note by Colonel MacArthur. The masses of eggs were encysted in fibrous tissue walls. There was no round-cell infiltration nor other sign of inflammation. The eggs were of the typical barrel-shaped appearance, and sections of adults also appeared in the tissues.

R. T. L.

PODJAPOLSKAJA (V. P.). [*Trichostrongylus instabilis* **in the Intestine of a Child.**]—*Russian Jl. Trop. Med.* Moscow, 1924. No. 2. pp. 64–65. [In Russian.]

In 1922–3, 8 children between the ages of 2½–14 years were examined post-mortem by the author. In two there were cestodes which owing to bad preservation could not be further identified. The other six cases harboured only parasites belonging to the Trematoda [Nematoda!], viz. (1) *Enterobius vermicularis* in all of the eight bodies; (2) *Ascaris lumbricoides* in five; (3) *Trichuris trichiura* in two, and (4) Trichostrongylus in one.

The Trichostrongylus occurred in a girl 7 years of age who died in 1922 of tubercular meningitis. In this case three types of worms were found, *Enterobius vermicularis* numbering in all over 2,800, *Ascaris lumbricoides* over 50 and a single Trichostrongylus which was of very small dimensions, and scarcely visible to the naked eye. This male specimen gave the following measurements:—

Length of body	4·446 mm.
Thickness in front of bursa	0·0779 mm.
Length of oesophagus	1·6 mm.
Length of spicule	0·1375 mm.
Length of gubernaculum	0·0779 mm.

The previous cases of this infection in man were recorded by Looss from Egypt and this is the first human case in Russia and indeed in Europe. [The species is common in sheep in Europe.]

R. T. L.

SWEET (W. C.). **The Activities of the Australian Hookworm Campaign.**—*Med. Jl. Australia.* 1924. May 17. 11th Year. Vol. 1. No. 20. (Supplement.) pp. 319–322. [5 refs.]

The Australian Hookworm Survey was begun on October 1st, 1919. and was completed by December 31st, 1922. The whole Continent was surveyed, either by examining representative groups of persons in different occupations and age-groups, or by a thorough house-to-house canvas in certain chosen areas. The results showed that there was no infection in Victoria or Southern Australia and practically none in Tasmania, only 2 being found positive amongst 2,209 examined. In Western Australia ankylostomiasis is practically confined to the coastal aborigines in and around Beagle Bay. In the Northern Territory infection is higher (16·7 per cent.), nearly all acquiring the disease in the extreme northern part where the rainfall is over 50 inches. In New South Wales the incidence-rate is 3·3 per cent., in Queensland 9·2 per cent., there being an endemic hookworm area in the latter comprising Cape York Peninsula and a coastal strip from Cook Town to the Tweed River. In Papua and New Guinea the rates were 59·2 and 74·2 per cent. respectively. It was found that where the rainfall was above 45 inches hookworm disease was usually endemic, but that other climatic conditions are also concerned is shown by the fact that whatever the rainfall no endemic disease was found south of 32° South latitude.

As regards age incidence, among the natives who go barefoot the highest rate was found during the most active years of life, 19 to 40, but amongst the whites the school-age group (6–16 years), which is the barefoot age-group, shows the highest incidence.

Progress so far has been good, and the author points out that sporadic or intermittent activities are useless, and he recommends co-operation of the Commonwealth with the States of Queensland and New South Wales, the chief parts affected, in organizing and carrying out measures of control.

H. H. S.

SMILLIE (W. G.). **Control of Hookworm Disease in South Alabama.**—*Southern Med. Jl.* 1924. July. Vol. 17. No. 7. pp. 494–497. [2 refs.]

The principles in regard to hookworm infection observed in South America also hold true for those portions of the United States in which those factors exist which are favourable to hookworm infestation, viz., favourable climate, favourable top soil for larva development and continuous soil pollution. After one year's observation in Covington County it seemed perfectly clear that the hypothesis that severe hookworm infection occurs almost exclusively in rural children of school age is correct. The infection rate in adult town dwellers in Covington County is less than 10 per cent., while from 40 per cent. to 50 per cent. of the children in the town schools are infected to a slight degree. All severe infections are in children who live in the country and drive to town to school. In the rural children of school age the infection rate is 99 per cent., and many are very heavily infested. It is not at all rare to find over one thousand worms in a child of twelve years, and clinical cases of severe hookworm disease are seen in every rural school. The disease can be eradicated within a single year by mass treatment of the rural school children, but the hookworm infection is never permanently reduced by treatment. For this sanitation is essential. Combined with treatment, sanitation measures should be pushed until at least 80 per cent. of the rural homes have closets.

R. T. L.

JACOCKS (W. P.). **Hookworm Infection Rates in Eleven Southern States as revealed by Resurveys in 1920–1923.**—*Jl. Amer. Med. Assoc.* 1924. May 17. Vol. 82. No. 20. pp. 1601–1602. With 3 charts in text.

A resurvey was carried out in the period 1920–1923 to estimate what degree of improvement had taken place since the first campaign against hookworm in 1910–1915 in the States of Virginia, North and South Carolina, Georgia, Alabama, Mississippi, Louisiana, Texas, Arkansas, Tennessee and Kentucky. 81 of the 422 counties originally surveyed were chosen and the infection-incidence was found to have fallen from 55·1 to 27·8 per cent. The actual severity of infection, however, is much less than formerly, so that the degree of improvement is, in reality, greater than the mere percentage of persons harbouring the parasites would indicate. In a remote fishing district on the North Carolina coast the incidence in the first survey proved to be 16·6 per cent., whereas in 1923 of 308 examined only one was found to be positive. The primary treatment must, therefore, have been thorough and effective.

H. H. S.

HILL (Rolla B.) & EARLE (Walter C). **The Presence of** ***Ancylostoma duodenale*** **in Porto Rico.**—*Bull. Porto Rico Med. Assoc.* 1924. June. Vol. 18. No. 145. pp. 6–7.

The authors examined the faeces of 64 persons in the Arecibo district, 50 of them from the jail. All came from the northern part of the island. Sixteen were found to be harbouring Ancylostoma, the average being 4 per person; amongst the same individuals the number of Necator was 419 per person. From the association with Spaniards of those infected with Ancylostoma it is conjectured that this parasite was first introduced from Spain.

H. H. S.

MARTINEZ BRICEÑO (Rafael). **Importancia social de la campaña contra la Anemia Tropical.**—*Repert. Med. y Cirug.* Bogota. 1924. Feb. Vol. 15. No. 5. (No. 173). pp. 227–241. With 4 figs.

The hookworm campaign was started in Bogota in 1920. Since then the number of persons treated totals 206,453, of whom 133,405, or 64·6 per cent., are recorded as cured. The installation and use of latrines have met with considerable opposition, as the general opinion is that they are a luxury, not a necessity, that it is better to deposit excreta on the ground, where they are dried by the sun, than in "dark, evil-smelling holes," that the inspectors, in their visits, place magic powders in the latrines in order to spread disease and, perhaps, sudden death, and that the anaemia is due to starvation and, therefore, the money spent in erecting latrines would be better used in providing food.

Tables are appended showing the numbers treated year by year and the cost.

H. H. S.

CALLENDER (George R.) & BITTERMAN (Theo.). **Hookworm Infection in Filipino Soldiers.**—*Milit. Surgeon.* 1924. Oct. Vol. 55. No. 4. pp. 434–442. With 1 fig. [8 refs.]

As a result of an investigation into the prevalence of hookworm in Filipino soldiers it was found that 53 per cent. were infected, but that, from examinations of men grouped according to length of service, the infection tended to die out fairly rapidly owing to the prevention of re-infection through the wearing of boots. Thus, 77 per cent. of recruits were infected, but only 18 per cent. of those with ten years' service.

Blood examinations showed that infection was not generally severe, since there was no fall in the haemoglobin and the eosinophilia was only 8 per cent.

H. H. S.

MAPLESTONE (P. A.). **A Critical Examination of Stoll's Method of counting Hookworm Eggs in Faeces.**—*Ann. Trop. Med. & Parasit.* 1924. Aug. 2. Vol. 18. No. 2. pp. 189–194. [1 ref.]

The author tested in various ways the accuracy of the method published by STOLL for estimating the number of hookworm eggs in faeces [see this *Bulletin*, Vol. 20, p. 950]. A comparison with the salt concentration method showed considerable discrepancies. In one instance, 5½ times as many eggs were found by the latter method as by the former. Further, STOLL stated that no cultures of the same faeces produced as many larvae as were shown by egg counts. This also was demonstrated not to hold good. The subjoined Table gives some of the author's results in which these facts are shown.

Number of specimen.	Eggs per gm. by Stoll's method.	Eggs per gm. by salt concentration method	Larvae per gm. in control cultures.
1	900	5,092	4,080
2	600	236·5	Not done.
3	150	231·5	353
4	150	369	450
5	600	394·5	796
6	10,000	6,414	8,833

H. H. S.

CORT (William W.). **Investigations on the Control of Hookworm Disease. XXXII. Methods of Measuring Human Infestation.**—*Amer. Jl. Hyg.* 1924. May. Vol. 4. No. 3. pp. 213–221. [9 refs.]

There are fallacies in evaluating human infestation in terms of the incidence of hookworms. Two hypothetical examples are used to illustrate the differences in value between information on the incidence and on the degree of human infestation. Incidence statistics are useless in estimating the results of control work or in epidemiological analyses. The author considers that the time is now ripe to discard completely the rôutine re-examination after treatment. One of the most important possibilities of the " egg-counting " method is its use in measuring the results of control work and especially the degree in which this has lasting effect in keeping down hookworm infestations. Certain far-reaching modifications of administrative procedure in hookworm control suggest themselves, for the use of the egg counting technique in preliminary surveys will provide quantitative data upon which to plan adequately control measures. Its use in evaluating treatment will save the expense of routine examinations and it can be used to measure the results of control measures.

In illustration of the failure of incidence statistics the recent results of SMILLIE in Brazil are quoted. A resurvey of an area where control work had been carried on for four years showed, by faecal examination, an incidence of 69 per cent. infestation as compared with an original rate of 71·2 per cent. A survey of health of this population showed a great improvement and hookworm disease had apparently disappeared. A series of worm counts gave an average worm index of only 14 per individual, whereas the original worm count in this area is estimated to have been about 300 per individual. Here was a reduction of mass infestation of about 95 per cent., while there was only a reduction of 2·2 per cent. in the number of individuals found positive by faecal examination.

R. T. L.

HIRST (L. Fabian). **Investigations on the Epidemiology of Hookworm Disease in Colombo. Part I. On the Isolation and Identification of Infective Nematode Larvae. Part II. Observations on the Viability of Hookworm Larvae.**—*Ceylon Jl. Science* (Section D. Med. Science). 1924. June 4. Vol. 1. Pt. 1. pp. 1–31. With 1 plate. [18 refs.]

The greatest gaps in our present knowledge of the epidemiology of hookworm infection relate to the viability and behaviour of the ova and larvae in soil, more especially under tropical conditions. The author has applied three tests to determine whether larvae found in soil are infective to man or are merely free-living nematodes. These are :—

(1) The *Aerotropic Test.* The larvae of Necator, Ancylostoma and Strongyloides show *aerotropism, i.e.*, extend singly or in groups into the air from the surface of suitably prepared cultures. (2) *Membrane Penetrative Test* :—The larvae show *thigmotropism, i.e.*, will pass through buckskin into warm saline solution. (3) *Vital Penetrative Test* :—If over 1,000 larvae are used for skin infection, some will later be found in the trachea, *i.e.*, the larvae show *histotropism.* It was observed that in a culture in which the larvae showed aerotropism the saturated atmosphere of an incubator caused aerotropism to be replaced by thigmotropism for the larvae disappeared into the soil.

In Part II a series of laboratory experiments in which fully matured larvae over ten days old were used led to the conclusion that hookworm larvae under laboratory conditions in Colombo in a variety of different soils can survive at least four months. Cultivated Necator larvae survived 120 days in the interstices of the unsterilized laterite soil. Larvae lived about 3 months in water and in fluid extracts of trench soil. It was also apparent that larvae which had become unsheathed could survive in the soil for long periods. [These results differ in important respects from those recently reported by CORT and others from studies in the West Indies.]

R. T. L.

RAMSAY (G. C.). **Hookworm Dissemination.** [Correspondence.]—*Indian Med. Gaz.* 1924. May. Vol. 59. No. 5. p. 269.

In reply to Dr. B. MCVAIL, who asked how the larvae hatched from pigs' faeces were proved to be larvae of the human hookworm, the author explains that he bases his conclusions on the fact that " human ankylostome ova were found apparently intact in the faeces of pigs which had swallowed human faeces, that larvae indistinguishable from human hookworm larvae hatched out in cultures" and that no hookworms were found in the pigs at post-mortem. Dr. MCVAIL has pointed to the destructive effect of temperatures above 98·4°F. on the ova of ankylostomes and necators, whereas the normal temperature of the pig is 104°F. ; to this the author replies that hookworm ova will hatch from faeces of patients suffering from pneumonia and malaria and with temperatures ranging from 102°–105°F.

R. T. L.

DARLING (Samuel T.). *Ancylostoma braziliense* **de Faria, 1910, and its Occurrence in Man and Animals.**—*Amer. Jl. Hyg.* 1924. Sept. Vol. 4. No. 5. pp. 416–448. With 10 figs. [16 refs.]

This article starts with a general survey of previous opinions as to the identity or otherwise of *A. braziliense* and *A. ceylanicum*, after which a description of each is given, as recorded. The main differences are that the small tooth of the former is smaller than the corresponding tooth of the latter, and the caudal bursa has longer and finer rays, especially the externo-dorsal.

The author has examined specimens from various parts of the world—Malay States, Java, Manila, Fiji, Brazil, Panama and Sierra Leone—and he demonstrates that the size and conformation of the teeth are inconstant features and that erosions, shortenings and bluntings of them occur. Also the size of the worms varies not only with the host, but even in the same host. Thus, the male *A. braziliense* in man in India has a length of 8·5 mm., in the cat in Brazil only 4·7 mm.; in the dog in Manila 8 mm., in the same animal in Brazil 6·5 mm. (some allowance may perhaps have to be made for shrinkage in the method of fixation). However, the differences are such that if specimens from Malaya and Brazil were submitted for examination they would almost certainly be regarded as distinct species, but examination of a large number from various hosts—man, dog, cat, civet cat—in different geographical regions shows that all are mere variations in a single species.

Infection by *A. braziliense* in man is found to be very slight as compared with that by *A. duodenale* or *N. americanus*. Even the Chinese night-soil coolies in the Federated Malay States only show some 5 per cent. infection as compared with the other two as 100, and in 7 Europeans infected with these latter no *A. braziliense* were found. As a rule the number was small, 1 or 2, sometimes 3 or 4, once 29, although the larvae must be present in the soil, since dogs may harbour between 200 and 300, and barefooted natives must come into contact with the larvae. [On p. 418 are the words " Leiper receded from his position as to the synonymy . . . and said that de Faria's paper of 1914 contributed details which tended to show that the two species were distinct." The second part of this is correct, but the point stressed by DE FARIA which led to this statement has since been abandoned and Professor LEIPER was not stating his own opinion but was merely abstracting or summarizing DE FARIA's paper.]

H. H. S.

VAN THIEL (P. H.). **De differentieeldiagnose van de strongyloïde larven van** *Necator americanus* **en** *Anchylostoma caninum.* [The Differential Diagnosis of the Larvae of *N. americanus* and *A. caninum.*]—*Tijdschr. v. Vergelijkende Geneesk. enz.* Leyden. 1924. Sept. 10. Vol. 10. No. 4. pp. 282–285. With 4 figs. English summary pp. 285–286. [3 refs.]

The author found the following differences between the encysted larvae of these two hookworms:—

1. *Mouth cavity.* In *Necator* the head end of the chitin-cylinder consists of two thick chitinous processes generally bent outwards; in *A. caninum* the chitin-cylinder is much thinner and the processes are thin and not bent outwards.

2. *Cuticle.* The striations on the cuticle are more pronounced in *Necator* than in *A. caninum.* In the former the distance between the striae is 1·52μ.

R. T. L.

STEKHOVEN Jr. (J. H. Schuurmans), & STEKHOVEN-MEYER (A. W. Schuurmans). **Voorbereidende onderzoekingen met betrekking tot de differentiatie van de larven van de mijnwormen van mensch en hond.** [Preliminary Investigations with regard to the Differentiation of the Hookworm Larvae of Man and Dog.]—*Tijsdchr. v. Vergelijkende Geneesk. enz.* Leyden. 1924. Apr. 26. Vol. 10. No. 2-3. pp. 101-119. With 23 figs. English summary p. 118.

The authors have tried to find an easy method of differentiating the different hookworm larvae; complicated methods, however trustworthy, being useless for every day use (*e.g.*, it is a well-known fact that each nematode species is composed of a definite number of cells, yet to count these cells is such a complicated procedure as to be useless). The authors therefore tried to find if this differentiation could not be made on biometric lines. Consequently the eggs from the uteri of *A. duodenale, A. caninum, A. ceylanicum* and *N. americanus* were carefully measured. From the measurements it was found that the eggs could be arranged into two groups. 1. *A. caninum* and *N. americanus*, and 2. *A. duodenale* and *A. ceylanicum*. Further, that these results showed a distinct difference in size between the eggs of *A. caninum* and *A. ceylanicum,* the eggs of the former being generally longer and broader than those of the latter. However, for general practical use, the variations in the size of the eggs overlap to such an extent that it would be almost impossible to state from the hookworm eggs contained in a given sample of faeces whether the faeces was of human or canine origin. Attention was now paid to the larvae, the head, head-papillae, mouth cavity, cephalic glands, genital primordium, rectum, anus and tail being especially examined; although differences were noted, yet the authors concluded that there is not one which makes a certain determination of the larvae possible.

The larvae were also examined biometrically, but, unfortunately, no results were obtained which would render this method of any practical use.

R. T. L.

DE LANGEN (C. D.) & DJAMIL (Moh.). **De nierfunctie bij ankylostomiasis.** [The Function of the Kidneys in Hookworm Disease.]—*Geneesk. Tijdschr. v. Nederl.-Indië.* 1924. Vol. 64. No. 2. pp. 294-303.

Haemolysis is not the cause of hookworm anaemia, the typical features of haemolysis (increased bilirubinaemia and urobilinuria and high urobilin content of the faeces) being absent in uncomplicated hookworm disease. The clinical picture suggests toxic influence on the bone marrow causing the aplastic anaemia, as well as on other organs (disorders of the nervous system and endocrine organs). By means of "Ambard's constant" the authors tested the influence of the hookworm toxins on the kidneys. Preliminary tests in healthy individuals showed that disorder of the kidneys may be presumed if Ambard's constant exceeds 0·1. In 11 out of 17 hookworm patients this was the case, whilst the value exceeded 0·1 in only 3 out of 14 sufferers from nontoxic, destructive malaria anaemia. In 4 patients examined in this respect after removal of the hookworms Ambard's constant became normal long before the haemoglobin percentage reached the normal level. The disturbance of the kidney function is not a sequel of the anaemia, but a specific toxic symptom.

W. J. Bais.

BAGCHI (Harendra Nath). **A Case of Urticaria due to Hookworm Toxin.**—*Calcutta Med. Jl.* 1924. Aug. Vol. 19. No. 2. pp. 83–84.

The case of a girl, 13 years of age, is recorded in which there were repeated attacks of urticaria lasting for 1–7 days, sometimes preceded by epistaxis, associated with an eosinophila of 30 per cent. and the presence of hookworm ova in the faeces. Treatment by oil of chenopodium brought about a cure.

H. H. S.

HAYASHI (Shunzo). [**Biochemical Study on the Nature of Anemia in Ankylostomiasis.**]—*Aichi Igakkwai Zasshi* (*Jl. Aichi Med. Soc.*). 1924. Mar. Vol. 31. No. 2. [Summarized in *Japan Med. World.* 1924. Aug. 15. Vol. 4. No. 8. p. 206.]

The demonstration of a haemolytic substance in alcoholic extracts of hookworm leads the author to consider "the pathogenesis of anaemia in ankylostomiasis to be due to the intoxication anaemia from the parasitic toxins rather than either haemorrhagic or intestinal obstruction anaemia," although these latter might play an accessory rôle in the production of the symptoms.

R. T. L.

TSUTSUI (Goichiro). [**Experimental Investigation on the Resistance of Ancylostoma Eggs against Heat.**]—*Taiwan Igakkwai Zasshi* (*Jl. Formosan Med. Soc.*). 1924. Mar. No. 233. [Summarized in *Japan Med. World.* 1924. Aug. 15. Vol. 4. No. 8. p. 210.]

In faecal matter hookworm eggs die when raised to a temperature of 57° C. or higher for a few minutes. The larvae in the same medium are also killed.

R. T. L.

TULL (J. C.). **An Analysis of One Thousand Consecutive Cases of Ankylostomiasis treated in the District Hospital, Penang, during 1922 and 1923.**—*Far Eastern Assoc. Trop. Med. Trans. Fifth Biennial Congress, Singapore,* 1923. pp. 234–237.

All admissions to the District Hospital, Penang, have their stools microscopically examined. During 1922 and the first half of 1923, of 8,307 admissions, 1,000 cases harboured hookworms, *i.e.*, 8·3 per cent. There were seventeen deaths or 1·7 per cent. Of the patients, 463 were Chinese, 485 Indians and 23 Malays. The average haemoglobin on admission was 46 per cent. 178 had less than 30 per cent. and 72 less than 20 per cent. There was a rapid increase after the expulsion of the worms. In 46 patients the haemoglobin rose from between 10 and 20 per cent. to 35 per cent. in less than 17 days after the disappearance of ova from their stools. Treatment by oil of chenopodium cost about 1½d. a dose. The average number of hookworms expelled from the 1,000 patients was 78, while the largest number in one patient was 749.

R. T. L.

LEACH (Charles N.), HAUGHWOUT (Frank G.) & ASH (J. Earle). **The Treatment of Hookworm Infestation with Carbon Tetrachloride. A Clinical and Laboratory Study.**—*Philippine Jl. Sci.* 1923. Nov. Vol. 23. No. 5. pp. 455-513. With 1 plate. [9 refs.]

After a detailed clinical and laboratory study on 100 long term inmates of Bilibid Prison, Manila, it is affirmed that carbon tetrachloride possesses virtues against hookworm which can be claimed by no other drug. Yet much remains to be added to our knowledge concerning its pharmacology and the extent and duration of pathological effects it may sometimes bring about. The authors now have no anxiety in administering 12·5 or even 15 cc. of the drug in selected cases. Not only have they had no deaths but also in no cases treated have symptoms of intoxication developed that called for treatment or gave the slightest anxiety. Many thousands of cases have since been treated elsewhere in the Philippines on precisely the same dose standards as employed in this investigation, with no accidents. They insist, however, that the drug should always be given under competent medical supervision. Doses of *pure* CCl_4 computed on the basis of 1 cc. to each 5·5 kilograms of body-weight are safe in the absence of contra-indication. The cases in which untoward symptoms have supervened may be traced, in the authors' belief, to impurity of the drug, alcoholism or disease of the liver; these being placed in their order of usual occurrence. Moderate alcoholism is not a contra-indication, provided liquor is withheld for 2 or 3 days before and after treatment. Saline purgatives *before* treatment apparently reinforce the irritative properties of the drug. Divided doses are both unnecessary and undesirable. The authors feel compelled to disagree radically with the conclusions of DOCHERTY and BURGESS that the lesions described by them were produced by carbon tetrachloride. [See this *Bulletin*, Vol. 20, p. 207].

R. T. L.

GIGLIOLI (George). **A Hookworm Campaign in the Interior of British Guiana.—Mass Treatment with Carbon Tetrachloride.**—*Trans. Roy. Soc. Trop. Med. & Hyg.* 1924. June 19. Vol. 18. No. 3. pp. 111-116.

In the two villages, Mackenzie and Akyma, in the interior of British Guiana, examination of a single faecal smear per man revealed a 68 per cent. infection with hookworm. In September, 1923, the whole population of 800 was treated by means of carbon tetrachloride in doses of 15 to 50 minims in water, without any preparatory measures, restriction of diet, or stoppage of work. Two weeks later, after re-examination of the faeces, only 6 per cent. infection was detected. In February, 1924, out of 100 examined 12 were passing ova, but none in large numbers. The cost was negligible, one cent per treatment.

The working capacity of the employees was considerably improved; whereas the trained men were loading 5·1 tons of ore per man per ten-hour day prior to treatment, the increase in tonnage 5 months later amounted to 1¾ tons per man per day.

H. H. S.

PESSOA (Samuel B.). **Experiments in the Treatment of Hookworm Disease with Carbon Tetrachlorid and Ascaridol.**—*Southern Med. Jl.* 1924. Sept. Vol. 17. No. 9. pp. 673–676. [1 ref.]

Two series of experiments were carried out. In the first, to twenty persons harbouring an average of 87·9 hookworms per patient was given a mixture of 0·75 mils of ascaridol and 1 mil of carbon tetrachloride; children were given doses proportionately smaller. Half an hour later a purge of magnesium sulphate was administered. 94·5 per cent. of all the hookworms were removed, and five persons were cured by this treatment. Toxic symptoms—tingling of the hands, dizziness and burning in the stomach—were slight and disappeared as soon as the purgative had acted. One patient, however, a girl of 18 years, suffered from severe headache with fever, rapid pulse and general pains, nausea and vomiting, which did not clear up for four days.

In the second series twenty-eight persons received 0·75 mils of ascaridol followed in half an hour by 1 mil of carbon tetrachloride and a purge. The average number of hookworms per case was 170. Seven were cleared of parasites and the average removal was 94·3 per cent. In this group also there was one case of severe intoxication, the symptoms being similar to those of the last except that there was jaundice and a slow pulse, which had not quite disappeared when the patient, an alcoholic subject, left ten days later. In both, the symptoms are ascribed to carbon tetrachloride and not to the ascaridol. *Necator americanus* seemed to be more susceptible to the drugs than *Ancylostoma duodenale*, for the first series 97·6 per cent. of the former were expelled to 71 of the latter, and in the second series 98·3 to 22·4.

A note is added that preference may be given to treatment by carbon tetrachloride in 1 per cent. alcohol "to prevent the formation of the toxic carbonyl chloride" but nothing relative to this is stated in the paper itself.

H. H. S.

BERCOVITZ (Nathaniel). **Hookworm Control in Hainan. A Study of 2,507 Cases treated in Campaign in Kachek Region.**—*China Med. Jl.* 1924. May. Vol. 38. No. 5. pp. 413–417. [1 ref.]

Inhabitants of the Hainan Province show a high hookworm incidence, 80 per cent. in some parts and 100 per cent. among the aboriginal Miao and Boi tribes. Infection, moreover, is severe, the haemoglobin in some cases being as low as 25 per cent. From May to September, 1923, systematic treatment was carried out. The population of Kachek is estimated as 750,000, and of these 2,500 have been treated during the above period. A mixture of oil of chenopodium and carbon tetrachloride, 1 part of the former to 10 of the latter, was employed, the dosage being 2½ minims for each year of life, with a maximum of 45 "drops" (3 cc.). Occasionally transient nausea and giddiness were complained of. One girl died 11 days after the treatment, but not, so far as could be ascertained, from the anthelminthic. The results of treatment are not stated, but a second survey of those treated is to be made later.

H. H. S.

MAIL (L. C.). **The Treatment of Hookworm Disease in Samoa.**—*New Zealand Med. Jl.* 1924. June. Vol. 23. No. 115. pp. 253–257.

In Western Samoa over 90 per cent. of the natives are infected with *Necator americanus.* At the present time sanitation is unknown, yet the benefits from treatment are so marked as to justify this as an interim measure. The author describes a medical journey made by this party with the object of administering carbon tetrachloride. One cc. is used for the infants and young children from 6 months to 10 years, 2 cc. from 10 to 16 years, and 3 cc. for adults. 400 persons were dealt with in an hour. The effect of the drug became evident in about half an hour, when most of the people showed symptoms of dizziness and in some cases of headache, but the effects were invariably mild and the only untoward result was the case of fainting in an old man of over 60 years. Two hours after the drug 3 to 4 ounces of a mixture of magnesium sulphate, one part in two parts of water, was given to adults or ½ to 1 ounce to children, depending upon their size rather than age. In the total number of cases treated, viz., 3,500, there were no instances of carbon tetrachloride poisoning.

R. T. L.

DESTÉFANO & VACCAREZZA. **[Treatment of Hookworm.]**—*Semana Méd.* Buenos Aires. 1924. Mar. 6. Vol. 1. p. 403. [Summarized in *Jl. Amer. Med. Assoc.* 1924. May 3. Vol. 82. No. 18. p. 1484.]

In thirty-eight cases of hookworm treated with carbon tetrachloride a microscopically verified cure was obtained in 60 per cent. whereas 30 per cent. was the highest percentage previously attained when chenopodium was employed. Its use in cases of hard drinkers or where there is transient or permanent hepatic insufficiency is deprecated.

R. T. L.

PETTIT (Auguste) & SICÉ (Adolphe). **Présence d'un Némathelminthe dans un foie humain.**—*Bull. Acad. Méd.* 1924. June 3. Year 88. 3rd Ser. Vol. 91. No. 23. pp. 716–718. With 1 fig.

While studying the lesions of the liver in trypanosomiasis in a negro about 20 years old, from the village of Zeug Meline, Haut Como, sections showed portions of a nematode, with the polymyerian type of body musculature, within strands of fibrous tissue within the liver substance, but the material could not be identified further by BRUMPT or NEVEU-LEMAIRE, to whom the sections were submitted.

R. T. L.

BELL (W. J. E.). *Ascaris lumbricoides* **encircled by a Glass Bead.**—*Jl. Roy. Army Med. Corps.* 1924. Feb. Vol. 42. No. 2. p. 145. With 1 fig.

CADEEA (Marco A.). **Departamento de Uncinariasis. Informe narrativo de clausura del laboratorio de Caldas (Antioquia).**—*Repert. de Med. y Cirug.* Bogotá. 1924. July. Vol. 15. No. 10. (No. 178.) pp. 510–518.

CARRASCO. **Hernie inguinale congénitale envahie par des ascarides-Herniotomie-Guérison.**—*Bruxelles-Méd.* 1924. Mar. 27. Vol. 4. No. 33. pp. 623–624.

GERLACH (W.). **Ueber mechanische Schleimhautschädigungen durch Askariden bei Askarideníleus.**—*Deut. Ztschr. f. Chir.* 1922. Vol. 173. pp. 396–404.

GIRGENSOHN (R.). **Die chirurgischen Komplikationen der Askariden-Helminthiasis.**—*Deut. Ztschr. f. Chir* 1922. Vol. 169. pp. 309-315.

HÜRZELER (O.). **Chirurgische Askaris-Erkrankungen.**—*Deut. Ztschr. f. Chir.* 1923. Vol. 178. pp. 393–401.

LAPENTA (Vincent Anthony). **Jejunal Stricture due to** *Ascaris lumbricoides.* **A Case Report.**—*Amer. Jl. Surgery.* 1923. Nov. Vol. 37. No. 11. p. 286.

LEE (C. U.). **A Preliminary Report on the Incidence of Filarial Infection amongst Chinese, East Indians, Portuguese, Blacks and Mixed Races in Georgetown.**—*British Guiana Med. Annual for* 1923. pp. 32–34.

[Reprinted from Report of the West Indian Medical Conference, 1921. See this *Bulletin,* Vol. 21, p. 563.]

LE ROY DES BARRES (A.): **Ascaridiose de l'appendice.**—*Rev. Prat. Malad. des Pays Chauds.* 1923. Dec. Year 2. Vol. 3. No. 4. pp. 269–274.

ZAPATA (Eloy). **Informe narrativo de clausura del laboratorio de Santa Bárbara (Antioquia).**—*Repert. de Med. y Cirug.* Bogotá. 1924. July. Vol. 15. No. 10. (No. 178.) pp. 518-529.

MISCELLANEOUS (CORRESPONDENCE).

JACKSON (J. H. S.). **Causes of Depopulation among some Island Peoples.** *Med. Jl. Australia.* 1924. Jan. 19. 11th Year. Vol. 1. No. 3. pp. 58–61.

With reference to this paper already reviewed (*ante,* p. 484), Dr. C. W. CILENTO, the Acting Director of Public Health for the Territory of New Guinea, writes, under date of 24th September 1924, that "the figures in relation to gonorrhoea," as there reported by Dr. JACKSON for the mandated territory of New Guinea, "now need very considerable modification," since Dr. JACKSON reports "that there are now over 300 natives in hospital suffering with the disease and that it appears to be very widespread."

TROPICAL OPHTHALMOLOGY: A REVIEW OF RECENT ARTICLES. II.*

THE CONJUNCTIVA.—*Caterpillar conjunctivitis* is probably far more frequent in the East than it is generally recognized to be. This gives an interest to GROVE'S[1] case of a young boy into whose eye a caterpillar was accidentally flipped; there was severe purulent conjunctivitis with much oedema and some corneal involvement followed by a perfect recovery.

Xerophthalmia. This is a deficiency disease depending on the lack of fat-soluble vitamin A. The subject is reviewed and a voluminous literature appended (BLEGVAD)[2]. MORI[3] of South Manchuria has studied the pigmentation of the bulbar conjunctiva, so familiar in xerosis cases, and has given at length his reasons for his conclusion that it is due to melanin.

TRACHOMA.—The interest in this disease appears to be becoming more intense and more world-wide with every passing year. Many of the communications are necessarily neither very new nor very important, but, at the same time, there are indications of a steady advance, and there are certain developments which may possibly prove of great value and will require to be followed carefully and critically. The task of the reviewer is under the circumstances a very difficult one.

Diagnosis.—The recognition of early cases of trachoma is becoming a very burning question. LI[4] discusses the subject from the point of view of China, and urges that all border-line cases should be treated as if they were trachomatous. STUCKEY[5], also writing from Chinese experience, gives much good advice, not the least valuable item being " never give a definite diagnosis of trachoma in the early stage when the patient has acute catarrhal inflammation and considerable discharge from the eyes." MORAX[6] speaks from the French colonial point of view, as it affects the parent country. He deals in turn with the various forms of conjunctival trouble which may be confused with trachoma, and discusses the difficulties of diagnosis and the different points which it is necessary to bear in mind. TRICOIRE[7] is deeply impressed with the importance of an early diagnosis of trachoma to the countries in which the disease is not endemic; a certain diagnosis may be difficult in early and in atypical cases, whilst both these forms are contagious; he is therefore seeking for a dermal reaction to assist in the diagnosis of these difficult cases, and has been injecting a small quantity of a suitably treated emulsion of trachomatous granules under the skin. The experiments were interrupted. Without being absolutely convincing—and the author does not claim that they are—they would certainly seem to justify a further trial of the method; should it prove a success, the discovery may have very far-reaching results. Closely allied with this work is that of SGROSSO[8] who examined the serum of trachoma patients by the complement fixation reaction in order to determine whether antibodies are formed in trachoma or not, and to ascertain the relation of the reactions observed to those found in other diseases. Scrapings from trachomatous conjunctivae and ground up lymphatic glands furnish the antigens employed. Out of 50 trachomatous cases 41 gave positive reactions with the trachomatous antigen. In a series of 18 cases all the sera were positive against trachomatous and lymphoid antigens. The sera of cases of spring catarrh and of ocular lesions not affecting the conjunctiva were negative.

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* For the first of this series see this volume, pp. 455–461.

[1] GROVE (B. H.). Caterpillar Conjunctivitis.—*Amer. Jl. Ophth.* 1914. Feb. Series 3. Vol. 7. No. 2. p. 140.

[2] BLEGVAD (Olaf). Xerophthalmia, Keratomalacia, and Xerosis Conjunctivae.—*Amer. Jl. Ophth.* 1924. Feb. Series 3. Vol. 7. No. 2. pp. 89–117.

[3] MORI (Shiunosuka). The Pathology of the Pigmentation of Bulbar Conjunctiva in Xerosis Epithelialis Conjunctivae.—*Jl. Oriental Med.* 1924. Feb. Vol. 2. No. 1. pp. 103–104. With 2 figs.

[4] LI (T. M.). Some Notes on the Early Diagnosis of Trachoma.—*Nat. Med. Jl. China.* 1924. Feb. Vol. 10. No. 1. pp. 1–6. [2 refs.]

[5] STUCKEY (E. J.). The Diagnosis of Trachoma.—*China Med. Jl.* 1924. Mar. Vol. 38. No. 3. pp. 182–184.

[6] MORAX (V.).—Les difficultés du diagnostic du trachome.—*Rev. du Trachome.* 1924. Jan. & Apr. Vol. 1. Nos. 1 & 2. pp. 19–32; 44–48. With 2 plates.

[7] TRICOIRE (R.). Essai sur l'intradermo-réaction du trachome. Contribution au diagnostic et à la prophylaxie de la conjonctivité granuleuse.—*Bull. Soc. Path. Exot.* 1923. Dec. 12. Vol. 16. No. 10. pp. 718–719.

Distribution and Prophylaxis.—MARQUEZ & SORIA[9] have studied the intensity of trachoma infection in Spain; they find that it varies very greatly, being heaviest along a zone bordering the shores of the Mediterranean, whilst in certain other areas cases are very rare indeed. Steps are being taken to establish a reliable index of trachoma infection for each of the provinces and to study the sources of the disease in the affected areas. It is suggested that the severe infection on the Mediterranean littoral comes from the north of Africa in the persons of fishermen and others. The same subject has been exercising the French surgeons, and in the first volume of the *Revue du Trachome* there appears an article emphasizing the increased importance which the disease has acquired in France owing to the influx of workmen during peace and of colonial troops during the war. BIDAULT[10] has devoted his attention to the incidence of trachoma in an oasis of the Sahara, and has worked out graphic curves for the first five years of life. These show that the frequency of the disease increases *pari passu* with the increase in the figure for acute infections of the conjunctiva; this is taken as strong evidence that acute conjunctivitis paves the way for the onset of trachoma. A number of other interesting points are made. FOX[11] states that among 1,168 persons, of the tribe of the Blackfeet Indians in the reservation in Montana, there are 351 cases of trachoma (30·05 per cent.); the tribe is increasing in numbers. He comments on the neglect of the American Government to deal radically with a section of its own people, whilst so active in combating the same disease among immigrants. PACHECO LUNA[12] was sceptical as to the correctness of his predecessor's view that trachoma does not occur in Guatemala ; but, after a rigid search, he has failed to find any cases, and urges that a strict examination of all immigrants should be made to safeguard the State.

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[8] SGROSSO. [Research in Immunity in Trachoma.]—*Arch. di ott.* 1923. Vol. 30, p. 326. [Reviewed in *Amer. Jl. Ophth.* Mar. 1924.]

[9] MARQUEZ & SORIA. Distribution géographique du trachome en Espagne.—*Rev. du Trachome.* 1924. Apr. Vol. 1. No. 2. pp. 54–57. With 1 chart & 1 map in text.

[10] BIDAULT (R.).—Statistique du trachome et des conjonctivites aigues dans la population infantile d'une oasis Saharienne (El-Oued Sud-Constantinois).—*Rev. du Trachome.* 1924. Apr. Vol. 1. No. 2. pp. 66-69. With 1 chart.

[11] FOX (L. Webster). Trachoma among the Blackfeet Indians.—*Arch. of Ophth.* 1924. Mar. Vol. 53. No. 2. pp. 166-171.

[12] PACHECO LUNA (F.). Contribución al estudio de Trachoma en Guatemala.—*Arch. de Oftal., Hisp.-Amer.* 1919. Feb.

HOWARD[13] states that about 15 per cent. of the population of South China is trachomatous ; the percentage rises as one goes north up to 90 per cent. in certain northern districts. Probably at least 30 per cent. of all Chinese are infected, or roughly 120 million people ; of these 30 million are children ; two million are blind in both eyes, and five million more in one eye ; 20 million more have such poor vision that they are economically useless. In China trachoma is the leading factor in blindness. The available Western medical men are too few in number to have any material influence on the evil ; all they can do is to commence the education of the people ; the training of specialists must go hand-in-hand with the development of health education and must pave the way for legislation in the future when the time is ripe. TALBOT[14] gives a further instalment of his description of the campaign against trachoma in Annam, noticed in a previous review. The main features of the work are (1) inspection in the schools ; (2) the working out of a trachoma index for the population ; (3) the standardization of a method of treatment, and (4) the instruction of the native teachers in the elementary facts of the prevention and treatment of the disease. SERGENT, FOLEY & PARROT[15] describe the compaign against trachoma in Algeria. PATON'S[16] paper deals with the prevention of trachoma in Australia and contains the interesting statement that 3·26 per cent. of 10,000 consecutive private patients showed evidence of trachoma. The characteristic features of the disease are stated to be " its curability as a community disease and its intractability as an individual infection." SCHOUSBOÉ[17] made an examination of the lids of soldiers in a Division in N. Africa (French, Indian and Algerian), and of a number of children belonging to the local population ; he has arrived at the following conclusions :—Trachoma never attacks healthy lids ; two factors are necessary for its inception—a lowered resistance in the patient, and an injury to the conjunctiva ; it is a disease of the poor and dirty, because their general health is poor ; it spreads in the family since the family consists largely of children ; it attacks the new arrival in a trachomatous area, if his conditions of life are unhealthy ; a germ is responsible, but the nature of the organism is still a mystery ; there is also, as an important factor, a predisposition of the patient to the disease. DARIER[18] has met with three cases in which he believes that trachoma was transmitted in the course of a wrestling match ; it may be recalled that PATTON, of Omaha, had a similar experience (*Amer. Journ. Ophthal.*, July 1922). PATTON was of opinion that the contagion is conveyed in the sweat, but DARIER thinks that the medium of infection is the fingers of the infected man, for it is said that the wrestlers deliberately dig their fingers into each other's eyes. Wrestling is a very common oriental sport, and this adds interest to the above observations. It only remains to mention that the July number of *Revue du Trachome* contains an article by ABADIE[19] on the prophylaxis and treatment of the disease.

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[13] HOWARD (Howard J.). The Eradication of Trachoma among School Children in China.—*China Med. Jl.* 1924. Apr. Vol. 38. No. 4. pp. 255-270. [6 refs.]

[14] TALBOT (R.). Essai de prophylaxie scolaire du trachome en Annam.—*Rev. du Trachome.* 1924. Apr. Vol. 1. No. 2. pp. 48-53.

[15] SERGENT (Edm.), FOLEY (H.) & PARROT (L.). La lutte contre le trachome en Algérie.—*Rev. du Trachome.* 1924. July. Vol. 1. No. 3. pp. 87-92. [1 ref.]

[16] PATON (D. D.). Trachoma.—*Med. Jl. Australia.* (Supplement.) 1924. May 24. Year 11. Vol. 1. No. 21. pp. 337-342. [10 refs.]

[17] SCHOUSBOÉ. Notes sur la contagion du trachome chez l'adulte et chez l'enfant.—*Rev. du Trachome.* 1924. Apr. Vol. 1. No. 2. pp. 58-66. With 1 map.

[18] DARIER (A.). Contagion du trachome chez les lutteurs.—*La Clin. ophtal.* 1922. Nov.

Treatment.—DONNELL[20] advocates the free and persistent use of comparatively strong solutions of silver nitrate in association with massage applied by means of cotton-wool swabs. This treatment is in the main that which was the routine practice in the Madras Ophthalmic Hospital during the reviewer's superintendentship of that institution, and for 20 or more years before that. Of its great value there can be no possible question : the results were all that DONNELL now claims for it. NICATI[21] has been trying subconjunctival injections of various drugs with a view to provoke phagocytic action in the cure of the disease, and has found that sulphate of copper is the most effective of all the preparations he has tried ; he claims for it that it is as specific a remedy for granular ophthalmia as mercury and arsenic are for syphilis. He uses it from 1 in 1,000 to 1 in 100, and prefers the stronger solutions. 2 cc. are injected, under stovain anaesthesia, on the first occasion and 1 cc. afterwards ; the injection is given immediately behind the everted tarsus. In from one to two weeks' time the severe oedema of the lids, provoked by the injection, subsides and the next dose can be given. The maximum number of injections has been six for each eye. SÉDAN & MORENON[22] have carried out NICATI's treatment and have found it good and safe, but severe ; the method is of particular value when a small staff has to treat large numbers of patients, or when the time available for treatment is short. They think that control of the intensity of the reaction is a consideration which should be aimed at and which should not be unattainable. NICOLLE[23] aims at cutting down the secondary infections, which so seriously complicate trachoma, by the means of suitable vaccines and serums. For the moment he is interested in the Weeks bacillus and is up against the difficulty that there appears to be a large number of strains of this organism in Tunis. SÉDAN & HERMANN[24] describe an operation whereby the cornea is completely buried beneath a conjunctival flap ; they have found this measure of great value in the treatment of corneal ulcers and in obstinate keratitis due to trachoma. DAVID'S (25) radical operation for trichiasis somewhat resembles that advocated by PANAS, but the cutaneous surface of the lid is not interfered with, and so a visible scar is avoided. A number of diagrams make the method easy to follow.

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[19] ABADIE (M.). Sur la prophylaxie et le traitement du trachome.—*Rev. du Trachome.* 1924. July. Vol. 1. No. 3. pp. 83–86.

[20] DONNELL (N. R.). Treatment of Trachoma with Strong Solutions of Silver Nitrate.—*Arch of Ophth.* 1924. Sept. Vol. 53. No. 5. p. 433.

[21] NICATI (W.). Note sur la curabilité de l'ophtalmie granuleuse par les injections stérilisantes et l'apparente spécificité d'action du sulfate de cuivre.—*Bull. Acad. Med.* 1924. Jan. 8. Year 88. 3rd Ser. Vol. 91. No. 2. pp. 62–64.

[22] SÉDAN (Jean) & MORENON (Jean). Essai de la méthode de W. Nicati chez les trachomateux florides.—*Rev. du Trachome.* 1924. July. Vol. 1. No. 3. pp. 98–105. [2 refs.]

[23] NICOLLE (Ch.). Recherches en cours sur la conjonctivite aigue á bacille de Weeks.—*Rev. du Trachome.* 1924. Apr. Vol. 1. No. 2. pp. 41–43.

[24] SÉDAN (Jean) & HERMANN (René). Traitement des ulcéres et kératites rebelles du trachome par l'enfouissement conjonctival. –*Rev. du Trachome.* 1924. Jan. Vol. 1. No. 1. pp. 6–11.

[25] DAVID (J.). A Radical Operation for Trichiasis of the Upper Eyelid.—*Arch. d'ophtal.* Dec. 1923.

MISCELLANEOUS.—DARIER[26] contributes an exhaustive paper on the methods of biological treatment in eye disease. An excellent abridged translation is to be found in the *British Journal of Ophthalmology* for August, 1924, p. 379. PILLAT[27] discusses milk injections in bacterial conjunctivitis.

THE LENS.—A case of complete traumatic dislocation of the lens under the conjunctiva was reported in a Hindu female as a result of a blow by a piece of bamboo in the dark. Accidents due to the people walking about in the jungle at night without lights are sufficiently common in the East to give them an almost oriental characteristic (GHOSH).[28] HAYES'[29] paper on accidents in cataract operations in China contains many good hints for the young operator, especially on the subject of prolapse of vitreous, but no allusion is made in it to blocking of the facial nerve in cataract operation or to the use of a conjunctival bridge (this *Bulletin*, Vol. 19, p. 63; Vol. 20. p. 986). Another paper full of valuable suggestion to the operator in the East is that on the after-treatment of cataract extraction by SMITH[30]. It is most interesting that he has not met with post-operative delirium or confusion of thought in China; this is quite different from Indian experience as well as from that in this country. DERBY'S[31] paper on modern aids to cataract extraction is another communication which should not be missed; he is strong on the paralysis of the orbicularis before operation and on the suture of a conjunctival flap. The last-named safeguard is also advocated by WOLFF.[32] The reviewer has for a number of years been using a conjunctival bridge and only regrets that he did not know of it during this work in the East. He would strongly reccommend it to surgeons in the Tropics. BARKAN[33] gives an account of three years' extractions performed by MELLER, of Vienna. These cases are of great interest, inasmuch as the conditions prevailing in Austria appear closely to resemble those found in some up-country Indian hospitals, for the patients were half-starved before admission, the food was bad, and the preliminary examination of the patients was sketchy and the precautions taken few. HOLLAND[34] writes on one hundred cataract operations performed in one day in an Indian station by Dr. FISHER of Chicago. The latter surgeon also contributes a paper on the subject to the *Indian Medical Gazette.*[35] The preliminary examination does not appear to have been very thorough and the results obtained will arouse some criticism in the minds of Western surgeons. The contention would be that the conditions under which the operations were done render a more scientific technique impossible. There may be something in this argument, but to the reviewer's mind the crying need of the East is not so much to pile up huge numbers of cataract cases as to keep the standard of the work done high ; this is all the more necessary at a time when European control is being rapidly and steadily lessened in the medical direction of affairs in India. A case of proptosis complicating a cataract extraction is dealt with by RAO.[36] SEDAN[37] met with a diabetic cataract which ran its course up to complete maturity in one month. HOLTH[38] presents an illustration of an Arabic bronze needle which he believes to have been used for the couching of cataract in the period immediately following the Mohammedan conquest of Palmyra.

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[26] DARIER (A.). Methods of Biological Treatment. Parenteral Injections of Milk as a Stimulant to the General Defences of the Organism. Autohaemotherapy. Paraspecific Vaccinotherapy & Serotherapy. Phako-anaphylaxis.—*La Clin. Ophtal.* 1923. Mar.

[27] PILLAT (A.). [Influence of Parenteral Milk Injections on Bacterial Conjunctivitis.]—*Klin. M. f. Augenh.*, 1923, vol. 70, p. 439. [Parenteral Milk Injections in Gonorrhoeal Blenorrhoea.] *Ibid.*, p. 289.

[28] GHOSH (N. N.). A Case of Complete Traumatic Dislocation of the Lens under the Conjunctiva.—*Indian Med. Gaz.* 1924. Aug. No. 8. Vol. 59. pp. 408–409.

[29] HAYES (Chas. A.). Accidents in Cataract Operations.—*China Med. Jl.* 1924. Feb. Vol. 38. No. 2. pp. 102–104.

[30] SMITH (D. V.). The After-treatment of Cataract Extraction.—*China Med. Jl.* 1924. Feb. Vol. 38. No. 2. pp. 105–111.

[31] DERBY (George S.). Modern Aids to Cataract Extraction.—*Jl. Amer. Med. Assoc.* 1923. Dec. 22. Vol. 81. No. 25. pp. 2091–2093.

[32] WOLFF (Julius). A Conjunctival Apron or Safety Flap in Cataract Extraction.—*Arch. of Ophth.* 1923. Nov.

[33] BARKAN (Hans). Cataract Extractions performed by Prof. Joseph Meller, of Vienna, 1919-1921. Review of Two Hundred and Forty-nine Operations. —*Jl. Amer. Med. Assoc.* 1923. Dec. 22. Vol. 81. No. 25. pp. 2086-2091. [9 refs.]

[34] HOLLAND (H. T.). 100 Cataract Operations performed in one day at Shikarpur, Sind, India.—*Arch. of Ophth.* 1924. Mar. Vol. 53. No. 2. pp. 155–161.

GLAUCOMA.—HOLLAND[39] publishes a family tree of hereditary glaucoma affecting three generations. A woman, her four sons and one grandson all suffered from double glaucoma of the congestive type ; the characteristic phenomenon of " anticipation " is suggested by the records. Such histories are not unknown in Europe, but this is probably the first to come from the Tropics. Glaucoma is so common in the East that HARSTON'S[40] review of the whole subject as it presents itself in China is worthy of careful study by those who work in the Tropics. It is necessarily dogmatic, but will probably be all the more valuable for that to those who have to work very much on their own.

FUNDUS LESIONS.—TERRIEN[41] attributes a bi-lateral optic atrophy to the action of an anti-typhoid vaccine given a few hours earlier. It is important to remember that cases of keratitis, iridocyclitis, choroiditis, etc., have been recorded as following anti-typhoid inoculations. Fortunately such occurrences are rare, and, furthermore, the risk involved is infinitesimal when weighed against the great advantages of the inoculations.

WOODS & MOORE[42] have observed 241 syphilitic patients who had received more than 3,000 injections in all of tryparsamide (a pentavalent arsenical compound allied to atoxyl and arsacetin). In 10·2 per cent. of the patients there was dim sight or dazzling alone, while in a further 5·5 per cent. there was contraction of the visual fields in addition to the presence of the above subjective troubles. The visual disturbances did not appear to be closely dependent upon the dose given; nor did disease of the central nervous system appear to predispose to the risks involved in the administration of the drug. Pre-existing syphilitic disease of the optic nerve does not necessarily contra-indicate the treatment. The writers hold that the use of tryparsamide should be limited to the treatment of trypanosomiasis and of neuro-syphilis, and they lay stress on the value of the services of a competent ophthalmologist to the physician in the management of these cases—the valuable lesson of team-work again.

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[35] FISHER (W. A.). A Day in the Shikarpur Eye Clinic —*Indian Med. Gaz.* 1924. May. Vol. 59. No. 5. pp 235–237

[36] RAO (B. K. Narayan). Some Interesting Eye Cases.—*Indian Med. Gaz.* 1924. Aug. Vol. 59. No. 8. pp. 409–410

[37] SÉDAN (J.). [Diabetic Cataract commencing and becoming completely Mature in a Month.]—*Rev. Gén. d'ophtal.* 1923. Aug.

[38] HOLTH (S.). An Arabic Bronze Needle from Antiquity for Depression of Cataract.—*Brit. Journ. Ophth.* 1924. June. Vol. 8. No. 6. p. 266.

[39] HOLLAND (H. T.). Hereditary Glaucoma affecting Three Generations —*Indian Med. Gaz.* 1924. Aug. Vol. 59. No. 8. p. 408

[40] HARSTON (G. Montague). Rational Procedure in operating for Glaucoma, with Special Reterence to Elliot's Trephine Operation and Law's New Operation. —*China Med. Jl.* 1924. Jan. Vol. 38. No 1. pp. 12–24. With 6 figs.

[41] TERRIEN (F.). Bi-lateral Optic Atrophy and Anti-typhoid Vaccination.—*Arch. d'ophtal.* Feb. 1923.

[42] WOODS (Alan C.) & MOORE (Joseph Earle). Visual Disturbances produced by Tryparsamide.—*Jl. Amer. Med. Assoc.* 1924. June 28. Vol. 82. No. 26. pp. 2105–2111. With 2 figs. [11 refs.]

GENERAL DISEASES.—*Beriberi.* SON[43] records two cases of haemorrhages surrounding the optic disc which he attributes in all probability to intoxication from some unknown poison occurring in beriberi. One was a male aged 20, the other a female of 23.

Cholera.—MUKERJI[44] met with a suppurative panophthalmitis occurring three weeks after a severe attack of cholera. He believes it to be a case of endogenous suppurative choroiditis, the infection being conveyed by a septic embolus which lodged in a choroidal vessel.

Diabetes.—ROBERTS[45] deals with the increase of hyperopia met with in diabetes and furnishes notes of five cases. He thinks that the phenomenon is due to changes in the lens and vitreous. The loss of vision was coincident with the diminution or disappearance of sugar in the urine. He discusses the whole question.

Dysentery.—JACOBIDES[46] discusses the visual disturbances which have been found to follow strong injections of emetine; the symptoms observed were lachrymation and slight congestion of the bulbar conjunctiva, photophobia, impaired visual acuity, mydriasis, the loss of the visual fields, especially on the temporal side, central scotoma, and periorbital pain. The retina and papilla were hyperaemic at an early stage, whilst later there were pallor of the disc and constriction of the retinal vessels. Recovery occurred in from two to three weeks. FERGUSON[47] met with amblyopia in a patient who was suffering from amoebic dysentery, and who had undergone emetine treatment. Complete visual acuity was eventually recovered. ZOELLER & MANOUSSAKIS[48] have studied the influence on sensitized animal eyes of the instillation of a concentrated emulsion of the Shiga bacillus. A kerato-conjunctivitis resulted and ended in recovery. A number of interesting points are placed on record.

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[43] SON (Yuko). [On Beriberi Weak Vision complicated with Retinal Haemorrhages.]—*Chuo Gankwa Iho (Central Jl. Ophthalm.).* 1924. Vol. 16. No. 1. [Summarized in *Japan Med. World.* 1924. Apr. 15. Vol. 4. No. 4. p. 102.]

[44] MUKERJI (S. K.).—A Case of Suppurative Metastatic Choroiditis after Cholera. —*Calcutta Med. Jl.* 1924. April. Vol. 18. No. 10. pp. 708-709.

[45] ROBERTS (W. H.). Increase of Hyperopia in Diabetes.—*Amer. Jl. Ophth.* 1923. Apr. Vol. 6. No. 4.

[46] JACOBIDES (Alexandria). Troubles visuels à la suite d'injections fortes d'émétine.—*Arch. d'ophtal.* 1923. Nov.

[47] FERGUSON (Arnold). A Case of Amblyopia due to Amoebic Dysentery with Complete Recovery.—*Brit. Jl. Ophthalmology.* 1924. Oct. Vol. 8. No. 10. p. 467.

[48] ZOELLER (Chr.) & MANOUSSAKIS. De la kérato-conjunctivite expérimentale dysentérique.—*C. R. Soc. Biol.* 1924. July 4. Vol. 91. No. 23. pp. 257 258.

Leprosy.—Luther PETER[49] has studied a case of leprotic nodular iritis with the aid of a slit-lamp and records the following interesting features :—(1) There was no invasion of the skin of the lids or of the conjunctiva ; (2) pain and ciliary congestion were absent despite involvement of the ciliary body ; (3) the microscope revealed (*a*) a superficial punctate keratitis ; (*b*) a tendency of the superficial process to spread to the deeper layers of the cornea, and (*c*) a nodal iritis totally different from other forms of plastic and serous iritis.

Malaria.—AMAT[50] describes a case as malarial retinitis and WORMS & PESME[51] attribute two cases of optic nerve atrophy to the same disease. It is necessary to scrutinize all such records very cautiously before accepting malaria as the cause of the phenomena, since there are so many possible sources of error. BOLLACK[52] contributes a résumé of the subject of quinine amblyopia, the most important statement in the paper being that the condition is very often followed by a severe retraction of the visual field, which makes orientation very difficult for the patient.

THE PRACTICE OF OPHTHALMOLOGY IN THE TROPICS.—LING[53] computes that there are between sixteen and twenty million blind or nearly blind people in China, whilst there are only two or three schools for the blind, all of which have been founded by Western Missions. Thirty per cent. of the Chinese have trachoma. There are 1,500 Western-trained Chinese physicians practising in China, of whom not more than 10 or 12 devote themselves to ophthalmic practice. The number of schools and of students is increasing rapidly whilst the eyes of the children are left uncared for. The outstanding needs are (1) a campaign against trachoma, and (2) the systematic correction of refractive errors in the schools. He urges that this is a matter for the Ministry of Education to take up. LOSSOUARN[54] has studied the injuries of the eye produced by certain powders which the Chinese are accustomed to introduce for the purpose of ocular medication. These powders vary in colour, are flavoured with menthol, and are mainly composed of calcium carbonate, prepared by powdering oyster shells. In one group of his cases there was an acute kerato-conjunctivitis with the usual serious complications of the traumatic forms of this trouble. In another, the symptoms were very chronic indeed, though corneal ulceration was sometimes present. HENDERSON in a review of this article in the *Brit. Journ. Ophthal.* for July, 1924, states that the Chinese barbers scrape the eyelids with filthy bits of wood as a routine practice, and that they thus spread trachoma.

R. H. Elliot.

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[49] PETER (Luther C.). Nodular Iritis due to the Bacillus of Hansen (Leprosy). Slit Lamp Studies.—*Arch. of Ophth.* 1924. May. Vol. 53. No. 3. p. 258.

[50] AMAT (M. Marin). [Malarial Retinitis.]—*Siglo Med.* Madrid. 1923. May 12. Vol. 71. p. 460. [Summarized in *Jl. Amer. Med. Assoc.* 1923. Aug. 4. Vol. 81. No. 5. p. 427.]

[51] WORMS & PESME. [Complications oculaires du paludisme.]—Communication to *Congrès de la Soc. française d'Ophtalmologie* (*Paris,* 12–15 Mai 1924). [Report by Dr. G. COUSIN in *Presse Méd.* 1924. May 31. Vol. 32. No. 44. p. 482.]

[52] BOLLACK (J.).—Les troubles visuels dans l'intoxication par la quinine.—*Medecine.* Paris. 1924. Jan. Vol. 5. No. 4. pp. 278–279.

[53] LING (W. P.). A Plea for the Conservation of Vision in China.—*Nat. Med. Jl. China.* 1924. Feb. Vol. 10. No. 1. pp. 20–24.

[54] LOSSOUARN (Pekin). A Study of Eye Injuries produced by Chinese Powders. —*La Clin. Ophtal.* 1923. June.

TUBERCULOSIS IN THE TROPICS.

KÉRANDEL. **La tuberculose chez les indigènes dans les colonies françaises.**—*Congrès de la Santé Publique et de la Prévoyance Sociale, Marseille,* 11–17 *Septembre* 1922. *Comptes Rendus.* pp. 114–115.

This is a summary of a paper published *in extenso* in the volume of Reports of the Congress, page 128.

Kérandel, dealing with the clinical features of tuberculosis in the different colonies, states that the pulmonary localization is the most common everywhere. Amongst African negroes, the ganglio-pulmonary type associated with infancy in Europe and peritoneal infections with adhesions are the most frequent manifestations of the disease. In the Annamites and Hovas, it is usual to observe the chronic type of tuberculosis characteristic of Western Europe. Amongst the Canaques, the pulmonary form is preceded by a prolonged and severe involvement of the lymphatic glands.

Since it is usual for the mothers to nurse their children at the breast, the question of infection by contaminated cow's milk does not come into consideration ; and the slight importance of this source of infection is still further emphasized by the fact that the Baras, a tribe situated in the south of Madagascar, completely escape tuberculosis although they consume unboiled milk derived from intensely infected herds.

Kérandel is doubtful about the effects of climate except that the dry air of the Sudan seems to militate against infection. He finds no direct connection between malaria and the spread of tuberculosis, nor between alcohol and the extension of this disease. He finds reason to think that syphilis, with its tendency towards fibrosis, leads to a chronic course in tuberculosis and thus favours the spread of infection by " carriers."

" *Le seul facteur étiologique qui se retrouve partout avec une constance impressionnante est la qualité de l'habitation. Partout où elle règne, la tuberculose est invariablement liée au manque d'air et de lumière, à la malpropreté, au surpeuplement et à la promiscuité dans l'habitation.*"

S. L. Cummins.

LASNET & TRABAUD. **Fréquence et évolution de la tuberculose parmi les divers contingents de l'armée du Rhin.**—*Congrès de la Santé Publique et de la Prévoyance Sociale, Marseille,* 11–17 *Septembre,* 1922. *Comptes Rendus.* pp. 121–128.

The extreme susceptibility to tuberculosis of the Senegalese as compared to the other elements of the Rhine Army is well brought out in the following table :—

Incidence of Tuberculosis per 1,000 *Men during* 12 *Months—by Races.*

Français	9·55
Marocains	11·73
Arabes	13·33
Annamites	15·31
Malgaches	18·88
Senegalais	86·07

The authors find that these acute Senegalese cases expectorate relatively few bacilli in comparison with the others, and tabulate their observations as follows :—

Results of Sputum Examination in Tuberculous Patients—by Races.

Races.	Broncho-pulmonary Forms.	Sputum positive.	Percentage of Positives.
French	1,082	245	22%
Moroccans	50	13	26%
Arabs	86	79	20%
Annamites	30	9	27%
Malagasy	29	8	27%
Senegalese	131	15	11%

The infantile type of lesions found post-mortem in these patients is again insisted on ; and the interesting point is made that it is rare to find foci of infection at the apices of the lungs ; an observation that appears to harmonize with that of OPIE on the pulmonary lesions of childhood. In the Arab troops " the resistance is greater through longer contact with Europeans " and the clinical picture does not differ much from that which is met with in Europe. The paper gives full particulars as to the administrative methods of disposal of tuberculous cases from the Rhine Army.

S. L. C.

GUÉRIN (F. H) & LALUNG-BONNAIRE. **Recherches sur la tuberculose pulmonaire en Cochinchine.**—*Far Eastern Assoc. Trop. Med. Trans. Fifth Biennial Congress Singapore 1923.* pp. 737–752. [2 refs.] and *Rev. d'Hygiène.* 1924. Apr. Vol. 46. No. 4. pp. 336–353.

This important communication amplifies and confirms the enquiries of BERNARD, KOUN and MESLIN* (1912) and throws much light upon the tuberculosis of Cochinchina. Tuberculosis is well known to the Annamites under the name of Binh-Ho-Lao (Consumptive Coughing Sickness) and they believe that it has existed amongst them from time immemorial. There exist Chinese treatises, dating back to very ancient times, in which pulmonary tuberculosis in its various forms is described in minute detail ; and it is natural to suppose that the Annamites, through their close association with the Chinese, must have had numerous opportunities of becoming infected—if, indeed, the disease was not endemic amongst them even apart from such contamination. Evidence from Missions long established in Indochina, as also the observations of medical men, such, for instance, as LALLUYAUX D'ORMAY (1860) and HÉNAFF (1903), quoted by the authors, indicate that tuberculosis has been observed as a wide-spread disease of the Annamites ever since Europeans have had occasion to interest themselves in native ailments. The authors place on record a total of 7,708 tuberculin tests carried out by them on native populations, the children of urban and provincial schools and upon various social groups, the test being executed with the tuberculin of the Pasteur Institute diluted in thrice its volume of neutral glycerine.

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* BERNARD (Noël), KOUN (L.) and MESLIN (Ch.). Épidémiologie de la tuberculose en Annam. *Bull. Soc. Path. Exot.* 1912. Vol. 5. pp. 234–240.

The scarifications are made with a vaccinostyle and a "dry" scarification serves as a control. Results are read between the third and fifth day. The following table, extracted from a fuller one in the text, shows the *percentages of positive cuti-reactions*, by age groups, for 2,918 persons of various ethnic groups in the town of Cholon.

Age groups.	von Pirquet positives per cent.
0– 5 years	23·64
5–10 ,, ...	44·68
10–15 ,, ...	68·46
15–20 ,, ...	71·15
20–25 ,, ...	81–90
25–30 ,, ...	87·20
30–35 ,, ...	91·78
Over 35 ,, ...	91·72

Von Pirquet statistics for various schools are also given and exhibit a marked difference between the high percentages amongst the day scholars of Cholon, who live, in the intervals of classes, in surroundings exposing them to frequent infections, and those of the Provincial schools where the children inhabit country homes and live in more hygienic surroundings. The findings serve to demonstrate the importance of home infection as the principal source of tuberculosis in Cochinchina, a conclusion which is supported by the rarity of bovine infections and by the known fact that the natives do not drink cow's milk. The wide-spread character of the disease amongst the Annamites is emphasized in the results of tuberculin tests. The clinical type, too, is frequently the chronic ulcerative variety of pulmonary tuberculosis familiar in European countries, although there appears to be a considerable number of acute progressive cases, as in all countries where a large proportion of the population is engaged in agricultural pursuits. In proof of the suggestion that the type of tuberculosis in the towns tends to resemble that of Western Europe is the fact, recorded by the authors, that 40 per cent. of the sputa examined contain the tubercle bacillus. Education in hygiene, the early recognition of cases, the isolation of patients in large hospitals, the protection of infants and children from infection, and the initiation of "Oeuvres Grancher," are advocated as means by which the disease can be combated in Cochinchina.

S. L. C.

HEYDON (G. M.). **Tuberculosis in Natives of the Territory of New Guinea.**—*Med. Jl. Australia.* 1924. May 3. 11th Year. Vol. 1. No. 18. (Supplement.) pp. 277–279.

This short paper is of real value, as it records careful post-mortem observations and extensive tuberculin tests, thus providing a true idea of tuberculosis as it exists amongst the natives of New Guinea. Of 1,679 adult natives estimated to be over 15 years of age, 520, or 29·9 per cent., were positive to von Pirquet; of 353 children, 48, or 13·6 per cent., gave a positive reaction. The percentage of positives, especially amongst women and children, was definitely higher amongst the "indentured labour" group than amongst the free local natives from villages close to Rabaul. Of 116 newly recruited boys tested, only eight, or 6·9 per cent., gave a tuberculin reaction. It will be seen, therefore, that the percentage of positive reactions in New Guinea is very low, more especially in the natives furthest from contact with Chinese—thought by Heydon to be the principal source of infection—and Europeans. As was to be expected in such a community, the post-mortem results show a tendency to the "infantile" type of tuberculosis. Of 98 autopsies on natives, 22 were found to have died from tuberculosis and the disease was found to be present in seven patients dying from other causes. "Many of the cases were examples of very acute and rapidly spreading disease, with great tendency to generalization." Of the 29 cases dying from or with tuberculosis, five showed lymphatic gland lesions only, four were cases of tuberculous meningitis, six had purely thoracic disease and *fourteen* had died of generalized tuberculosis. This paper is of great interest and value and it is hoped that we may have still further observations from the pen of Dr. Heydon.

S. L. C.

D'ANFREVILLE DE LA SALLE (L.). **La tuberculose au Maroc.**—*Presse Méd.* 1924. June 28. Vol. 32. No. 52. (Supplément.) pp. 1091–1093.

At a conference of the Governors of the French colonies of North Africa, held in April last, a resolution was passed begging Parisian doctors to refrain from advising tuberculous patients to go to Morocco. This resolution was based on the now almost universally accepted opinion that the hot and dusty climate of the country, subject to violent storms and exceedingly trying at certain times of the year, is quite unsuitable for all cases of pulmonary consumption other than the resistant fibrotic types that tend, everywhere, to get on fairly well. There is also the fact to be considered that the advent of "open" cases is a source of great danger to the susceptible native population; and that there are very few openings for sick or debilitated persons to find lucrative employment. If, for special reasons, tuberculous patients are obliged to go to Morocco, they should avoid the coast towns and select the more favourable climatic conditions of Meknés and of Marrakech.

S. L. C.

REMLINGER (P.). **La tuberculose à Tanger.**—*Rev. d'Hygiène.* 1923. Sept. Vol. 45. No. 9. pp. 789–803. [7 refs.]

Tangiers, like certain other relatively isolated towns, had long enjoyed a considerable measure of freedom from tuberculosis, but with the increase of commerce and the added opportunities for contact with the outside world that began to prevail in 1912 the disease started to increase. Then came the European war and all its associated factors of overcrowding, movement of populations, spreading of germs, fatigue, want and privation, and the increase of tuberculosis became markedly accelerated. At about the same time (1912–13) that tuberculosis commenced to increase in the human population of Tangiers a similar phenomenon occurred amongst the cattle. With the introduction of infected stock from England, Holland, Spain, etc., a marked dissemination of the disease amongst the local cattle was observed.

"Non seulement la race autochtone n'a fait preuve d'aucune résistance naturelle à l'égard de ce bacille de Koch venu du dehors, mais encore—comme beaucoup d'organismes vierges—elle s'est contaminée vite et la maladie a revêtu chez elle des formes fébriles généralisées, à évolution rapide, comparables à celles qui étaient notées d'autre part en médecine humaine."

Remlinger devotes much of his charmingly written and highly interesting paper to pointing out the risks incurred by infected Europeans in going to Tangiers in the hope of cure. The high winds so frequently experienced, the rapid changes of temperature, the dust and the exciting climate combine to render the locality highly dangerous for pulmonary phthisis of a febrile and progressive type. Even chronic fibrous cases, though they sometimes do well, should avoid the sea coast and go inland. It is especially the violent dusty winds that are a source of danger in this disease. Surgical tuberculosis appears to do well.

S. L. C.

TRAMINI (J.). **L'infection tuberculeuse étudiée par les cuti-réactions dans le ksar d'Aïn-Sefra (Versant saharien des Hauts-Plateaux Oranais).**—*Arch. Inst. Pasteur d'Algérie.* 1923. Dec. Vol. 1. No. 4. pp. 624–626.

Aïn-Sefra is about 300 kilometres from the sea and at an altitude of 1,080 metres above sea level. The native village consists of irregularly placed masses of mud-brick houses separated by narrow twisting dark lanes and streets and including the high-walled airless courts and squares characteristic of Arab towns in North Africa. The sick mingle with the healthy and there is every facility for the spread of contagion. The towns-folk are good gardeners and raise a sufficient supply of vegetables for their own needs and for sale to the little garrison which occupies barracks and lines at a distance of 800 metres from the native quarters.

A table of tuberculin reactions is given, from which it appears that, in a total population of 1,160 inhabitants, the percentages of "positives" are as follows: –

Age.	Total Positive.	Per cent. Positive.
1–5 years	25 in 77 ...	... 32 per cent.
6–15 years	71 in 130 ...	... 54 per cent.
16 years and upwards	56 in 100 ...	... 56 per cent.

S. L. C.

DOLBEY (Robert V.) & MOORO (A. W.). **Surgical Tuberculosis in Egypt. An Analysis of 2,500 Cases.**—*Lancet.* 1924. June 7. pp. 1153–1154. [2 refs.]

This short paper is of the highest interest and raises questions of fundamental importance in connexion with tuberculosis. Of 2,500 cases of surgical tuberculosis seen at the Outpatient Department, or in the wards of the Kasr-el-Ainy Hospital, 1,197, or 47 per cent., were cases of tuberculous glands (site not stated, but it is presumed that these were principally cervical lymphatic glands), 804, or 32 per cent., were cases of tuberculosis of the flat bones, 159, or 6·3 per cent., were tuberculous peritonitis. Only 340, or 13 per cent., were cases of disease of the long bones or big joints. [It is of interest to compare these figures with those for 917 cases of non-pulmonary tuberculosis analysed by the reviewer for Wales in 1923. Here there were but 36·2 per cent. of tuberculous lymphatic glands, while " tuberculosis of bones," whether long or flat, amounted to only 8 per cent. Joints, other than spinal, on the other hand, were affected in 23 per cent. This comparison would appear to support the conclusion of the authors that, in a population with but little acquired immunity, tuberculous disease of the flat bones is more and of the large joints less common than in populations with a larger measure of acquired resistance.] In this connexion, the findings of the authors, based on the examination of human remains of different epochs, is of extreme interest; the percentage of tuberculosis of the flat bones being highest in eras of industrial activity while the long bones and large joints are more commonly affected during " agricultural " eras. The conclusions to be drawn from this important observation are an interesting subject for discussion. The authors interpret the facts as showing " that the tuberculosis of the long bones and the big joints is the result of infection by a strain of tubercule bacilli of attenuated virulence in a race that has gained its immunity; whereas the type of disease attacking the flat bones is of a new and exalted virulence in subjects with no acquired immunity." [In the opinion of the reviewer, a more probable explanation is that, in periods of industrial development, the non-immune population of agricultural areas is attracted to, or enclosed by, the growing towns, with a result that there is intensive contact infection of susceptible persons in crowded tenements and small houses of the urban type. In the " agricultural " eras, on the other hand, the resistant town populations would exhibit the clinical types characteristic of a relatively immune community; and it is probable the populations of the towns that have furnished most of the human remains which afford material for such observations as those now in question.]

The figures showing a marked increase in bovine tuberculosis in Egypt are of interest, as is the suggestion that some of the human surgical tuberculosis of that country may be of avian origin. The habits of the people would certainly favour the spread of disease from chickens to man; but, in view of the rarity of human infection with this very widely distributed bacillus, it appears rash to assume that avian infection of man is an important factor without the definite bacteriological evidence that ought to be adduced in support of the statement. The authors do not appear to have considered the question of human pulmonary phthisis as the source of surgical tuberculosis. In India, where surgical tuberculosis is rife, no other than the human source can be incriminated. What is wanted in Egypt is a careful " typing " of strains from cases.

S. L. C.

LEGER (Marcel). **La tuberculose au Sénégal ; Étude historique.**—*Bull. Comité d'Etudes Historiques et Scientifiques de l'Afrique Occidentale Française.* 1922. Oct.-Dec. No. 4. pp. 529-548.

The author points out that in the many excellent papers on tuberculosis in negroes, one erroneous conclusion is almost invariably drawn. to the effect that " tuberculosis is rare in Senegal." One of the chief objects in Dr. Leger's article is to disprove this contention, which is founded, as he freely recognizes, on a geographical rather than an epidemiological confusion of ideas.

In an interesting historical examination of the subject, he shows that the disease was recognized as occurring amongst Europeans in the coastal towns and amongst the natives brought in contact with them as far back as 1840; though, so unusual was it to encounter the disease amongst the inhabitants that THÉVENOT, in that year, stated frankly that the natives must possess against phthisis " une sorte d'immunité naturelle." It is interesting to note, with the author, the curious belief, at one time generally held by phthisiologists, that there existed an antagonism between malaria and tuberculosis. The celebrated Army Medical Officer, BOUDIN, who is quoted by Leger as having made great contributions to the knowledge of the diseases of Algeria, held this view strongly and expressed it as follows:—" Pour qui connaît la carte médicale de l'Algérie, la phtisie et le miasme palustre sont exactement comme les deux plateaux d'une balance." Phthisis was but rarely found in malarious localities; and, on the other hand, places noted for a high incidence of tuberculosis were found to be nearly free from malaria. [We cannot refrain from emphasizing, at this point, the probable explanation of this contrast, which has been frequently noted elsewhere, although Leger does not himself make any suggestions to elucidate it. Where malaria was rife, the white man did not settle and the native remained uncontaminated by the " White Plague." Where malaria was unknown or uncommon, the white man placed his garrison or organized his commercial system, and, here, the natives were exposed to contact with an infection against which they possessed no acquired resistance.] This theory of " antagonism " was, as Leger points out, finally exploded through the careful analyses of the facts by CRESPIN at the International Congress of Tuberculosis in 1905; when it was shown, not merely that no such antagonism exists, but that acute malarial infections favour the activity of the tubercle bacillus.

Attention is also given to the fluctuations of medical theory as to the effects of a warm and damp climate on the phthisis of Europeans. At one time the belief was almost universal that consumptive patients had everything to gain by a trip to Africa or a sea-voyage in the tropics. So potent was this view that the suggestion was made to build vast hospitals close to Algiers for the reception of consumptives from Paris, and it was only a close study of the facts by LOUIS and ANDRAL, acting for the Académie de Médecine, that led to the project being abandoned. Here again we see the observation of the rarity of tuberculosis amongst the natives misinterpreted to mean that the climate is antagonistic to the disease, not that the infection is absent save for the imported cases. Such erroneous conclusions were, of course, to be expected at a time when the infective nature of the malady was unproved and, for the most part, denied. Actual experience soon led to a complete change of opinion. In 1866, BÉRENGER-FERAUD is quoted by Leger as having reported as follows:—" Les phtisiques doivent se hâter de quitter au plus tôt le Sénégal s'ils ne veulent pas s'exposer à voir leur affection évoluer avec une extraordinaire rapidité."

It was especially through the investigation initiated by A. CALMETTE in 1910–1911 on the lines of systematic tuberculin tests applied on uniform lines throughout the African Colonies of France that the light of science came to be thrown upon the vexed question of tuberculosis in Senegal and the surrounding countries. The following quotation from Leger sums up the truth about tuberculosis as an endemic disease, and it would be well, indeed, if his words could be impressed upon the many statisticians who continue to apply purely arithmetical criteria to pathological problems. " Par les statistiques de morbidité et de mortalité, on n'est jamais que très imparfaitement renseigné sur la fréquence de l'infection bacillaire dans un pays. Il existe, en effet, à côté d'individus malades, un très grand nombre de sujets chez lesquels les manifestations morbides manquent encore ou même resteront constamment cachées, mais pourtant chez lesquels il y a eu imprégnation bacillaire. Ceux-ci sont de sources de contamination, d'autant plus dangereuses qu'elles sont cachées et restent ignorées."

The paper closes with numerous citations from the works of CALMETTE, BORREL, ROUBIER, TEPPAZ, CURASSON and others, with which readers of the *Bulletin* will be familiar. Leger shows that tuberculosis was at one time rare amongst the natives of Senegal, but that it is now quite common, and, in fact, rapidly increasing in the larger towns, such as Dakar and Saint-Louis, as well as in the surrounding districts. It is still very rare in the countries of the interior and of the neighbouring territories, whence recruits for the Senegalese regiments were so freely drawn during the war. He indicates the extreme difficulty of applying methods of prevention in native communities and calls upon the Government to give the matter its immediate and grave attention.

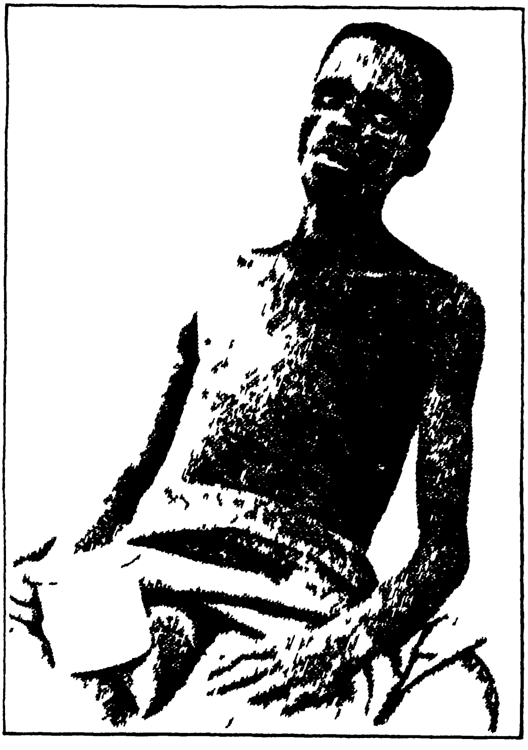
S. L. C.

ACCRA. **Report of the Medical Officer of Health, Accra, for the Year 1922.** [SELWYN-CLARKE (P. S.), Medical Officer of Health.]—69 pp. With 24 figs. & 2 charts. 1923. London: Waterlow & Sons, Ltd., London Wall. [Price 4s.]

This Report possesses the merit, rare, alas, in the Sanitary Reports of our Tropical Dependencies, of a careful review of the question of tuberculosis amongst the native races constituting the bulk of the population under consideration. It includes a series of Tables dealing, from 1913 onwards, with the tuberculosis by sexes, by occupations, by races and by clinical types; and a Table showing the relation of density of population to incidence of fatal tuberculosis is also given. The Report includes an analysis of the post-mortem findings in 24 cases examined during 1922 and is illustrated by two photographs and a chart. The statistical matter is, of course, vague, as was bound to be the case. The difficulties of obtaining accurate details as to age incidence, clinical type, and so forth, in a native population is always great. But the fact remains that a genuine effort has been made. It is safe to say that if Reports on similar lines were forthcoming from all our Colonies and Dependencies, our knowledge of tuberculosis as a disease of the Empire would be greatly increased.

Several interesting and important facts come to light in the Report. It is clear that the mortality from the disease is increasing amongst certain sections of the native population of Accra, this increase being most marked in the Northern Territory labourers, Kroos and Hausas. The indigenous race of Gas, having been longer in contact with Europeans, has acquired, as the author points out, a certain degree of immunity, and suffers less in consequence.

The clinical type appears to be, on the whole, very acute. Even the cases described by the author as " chronic " are noted as dying much more rapidly than do Europeans with comparable lesions, whilst the " acute " cases present the typical African type of progressive and rapidly fatal tuberculosis so well described by BORREL in the Senegalese Attention is called to the fact that only one case in thirty-seven suffered from haemoptysis, whereas about 60 per cent. or more of European cases present this symptom A similar observation was made by POWELL in his studies of tuberculosis amongst Indians in Bombay (See this *Bulletin,* Vol 20, page 185) This absence of haemoptysis is we believe, characteristic of the rapid caseo-necrotic tuberculous processes in the lungs of non-immune races, and is associated with the fact that the disease is too rapid in its course and too diffuse in its spread through the pulmonary tissue to allow of the ulcerative cavitation that slowly leads to the haemorrhages familiar in Western Europe The marked and rapid wasting that occurs once that disease has obtained the upper hand is well illustrated in a photograph (reproduced) of a Kroo labourer suffering from phthisis of two months duration This picture will be recognized as typical of the disease in African races by all familiar with the question



A Kroo labourer suffering from Phthisis of two months duration
(Photograph taken 10 days after admission to Contagious Diseases Hospital)
[Reproduced from *Report of the Medical Officer of Health, Accra, for the year 1922*]

While there is so much to praise in this interesting Report, there are, of course, several points as to which criticism may be excused. In Appendix H, for instance, there appears no reason to give separate headings to "phthisis," "pulmonary tuberculosis" and "phthisis pulmonalis " ; whilst the heading " tuberculosis " should be an inclusive one, not a sub-heading. In the analysis of post-mortem findings, while thoracic and cervical glands are quoted as diseased in one or two instances, we are given no information on this point in the other cases. It would have been of interest to know whether the mediastinal and bronchial glands were enlarged and caseous in all these cases. This is a point which should be looked for in all post-mortems on African natives.

S. L. C.

BRITISH GUIANA. **The British Guiana Society for the Prevention and Treatment of Tuberculosis. Seventeenth Annual Report of the Committee, 1923.** [GONSALVES (M.), President, & HASLAM (John F. C.), Hon. Sec.]—12 pp. 1924. Demerara: Printed by " The Daily Chronicle," Ltd.

This brief Report, while showing that British Guiana is engaged in a serious effort to cope with tuberculosis on modern lines, is of little interest to the student of tropical tuberculosis, since it deals chiefly with the administrative work of an anti-tuberculosis scheme and contains but few references to the clinical or epidemiological aspects of the disease. The death rate has fallen steadily in the last sixty years. It was 2·36 per 1,000 living in the quinquennial period 1876–1881 and had fallen to 1·31 in 1923. This rapid fall is of interest in view of the racial composition of the population. Of 276 tuberculous persons attended in 1923, 161 were of the black race, 46 of mixed race, 56 were East Indians, 12 Portuguese and 1 Chinese. It is worth notice that in a community where the black race predominates, the same tendency to the acquisition of resistance, as indicated by a falling death rate, should be manifest as in European countries.

S. L. C.

FERREIRA (Clemente). **Liga Paulista contra a Tuberculose. Exercicio de 1923. Relatorio apresentado á Assembléa Geral na sessão annual ordinaria de 27 de Maio de 1924.**—48 pp. With 1 chart. 1924. São Paulo: Typ. Cardoso, Irmão & Cia. Rua da Gloria N. 64.

The greater part of this Report deals with the statistics of the Clemente Ferreira Model Tuberculosis Dispensary and its routine work. Interesting as it is, and calculated to excite the admiration of the reader for what is being accomplished by this Brazilian Anti-tuberculosis Scheme, it can hardly be said to have any marked bearing upon the problems of tropical tuberculosis as usually understood. Of importance, however, both from its practical bearing on the treatment of tuberculosis and in relation to the allied disease, leprosy, is the portion which deals with the use of chaulmoogra oil and sodium morrhuate. The administration of the chaulmoogra oil, according to Heiser's formula, was tried on only five patients, of whom one got much better and returned to work, three abandoned the treatment quite early in its course and one was quite unaffected. Ten patients treated with sodium morrhuate showed appreciable improvement, one of them becoming cured to all appearances.

An allied preparation, *Gadusan*, in which cod liver oil is brought into a colloidal state, was also tried on a similar group of 13 cases, five of whom derived no benefit from it, while ten improved. Of these latter, seven were but slightly better, one markedly improved; and in two, the tubercle bacilli disappeared from the sputum.

S. L. C.

FREW. **A Note on the Use of Human Tuberculin as an aid to Diagnosis in Tubercular Disease among Natives.**—*Proc. Transvaal Mine Med. Officers' Assoc.* 1923. Sept. Vol. 3. No. 5. pp. 1–2.

Dr. Frew reports that he has obtained valuable diagnostic information by the subcutaneous tuberculin test in natives. The preparation used by him was "Old Human Tuberculin," obtained from Duncan Flockart & Co., of Edinburgh, and his dosage was as follows:—(1) 0·0025 cc., (2) 0·005 cc., (3) 0·01 cc.; the inoculation being, in each case, made up to 1 cc. with normal saline. The interval between doses would appear to have been 24 hours. No reaction was counted as positive if the temperature did not rise above 100° F.

Of 61 patients tested, 25 were regarded as positive. Of these 25 positive cases, 18 were subsequently examined by the Miners' Phthisis Bureau, 13 being found to have tuberculosis and 5 being regarded as free from the disease. Two of the negative cases, both very ill, were subsequently found to have tuberculosis—their reaction, no doubt, being eliminated by the intensity of the infection. [The reviewer ventures to suggest that it would be safer to use a smaller initial dose, say 0·0002 cc., as recommended by BANDELIER and ROEPKE, before proceeding to those now used by Frew; and a longer interval than 24 hours between the test doses is certainly to be recommended—at least 48, preferably 72 hours. If the temperature is carefully recorded beforehand, a rise *up to* 100° F. should be quite sufficient for a "positive."]

S. L. C.

ROGERS (Leonard). **Croonian Lectures on Researches on Leprosy and their Bearing on the Treatment of Tuberculosis. Lecture IV. The Use of Chaulmoogrates and Morrhuates in the Treatment of Tuberculosis.**—*Lancet.* 1924. June 28. pp. 1297–1302. [24 refs.]

The work of E. L. WALKER and M. A. SWEENY in 1920 (see this *Bulletin*, Vol. 17, p. 277), confirmed and extended, later, by that of Otto SCHOBL in the Philippines, showed clearly that the sodium salts of certain of the fractions of the fatty acids of chaulmoogra oil, proved by Rogers to be effective in leprosy, had a definite and specific action in inhibiting the growth of various acid-fast bacteria on artificial media. As the results of their observations, WALKER and SWEENEY were led to think "that it can be concluded with reasonable certainty that any therapeutic action which chaulmoogra oil may have in leprosy is due to its direct antiseptic and bacteriological action on *B. lepra.*"

Stanley GRIFFITH, however, working with sodium morrhuate added to solid media, proved that this preparation had no inhibiting effect on the tubercle bacillus. In view of the numerous observations tending to show that the morrhuate was of specific value in the treatment of leprosy, this latter finding was difficult to harmonise with the

" antiseptic " theory of WALKER and SWEENEY ; and, in fact, Rogers, in 1921, struck by the progressive improvement which often followed a single reaction-producing dose of either the gynocardate or the morrhuate, had been driven to conclude that the clinical findings " appear to be best explained on the theory that, during the extensive breaking down of the bacilli, antigens are formed, which bring about the subsequent prolonged improvement." This conception, alone, however, did not quite explain why the morrhuate, which does not lead to " extensive breaking down of the bacilli " *in vitro*, should be effective *in vivo*.

Investigations by A. SHAW-MACKENZIE, however, showing that the addition of 3 per cent. solutions of sodium gynocardate, morrhuate or oleate to a pancreatic extract " doubled the fat-splitting effect of the pancreatic lipase on an emulsion of olive oil at blood heat " led this observer to suggest " a direct stimulating action of tissue liposis in, at any rate, partial explanation of the therapeutic effect of sodium morrhuate and sodium gynocardate on acid-fast bacilli." Acting on this idea, Rogers obtained from E. MUIR a set of blood sera from Indian leprosy cases, treated and untreated, and estimated their lipase content with the following results: —

Type of Case.	No.	Highest figure.	Lowest figure.	Average.	Remarks.
Nodular, untreated ...	3	0·07	0·00	0·033	Very low.
Nodular, treated ...	9	0·29	0·08	0·22	Normal.
Nerve, treated	8	0·26	0·17	0·19	Normal.

These results are very striking, and, if confirmed on a larger series, must be taken to prove that in leprosy, as in tuberculosis, the blood lipase is very low and that treatment with the gynocardates or the morrhuate tends to restore it to normal in this respect. Subsequent work by E. MUIR supports this opinion and shows that a low lipase content of the blood in leprosy is of bad prognostic import. The experiments suggest, too, that SHAW-MACKENZIE'S theory is the one which most successfully covers the facts, though the observation of Professor J. B. COLLINGWOOD, that lipase has no appreciable action on tubercle bacilli *in vitro*, shows that it is necessary to regard the action of the chaulmoogratees and morrhuates as a " vital tissue action " if the theory is to be made applicable. Rogers is fully alive to the fact that the treatment of tuberculosis by substances acting by the disintegration of the bacilli and the liberation of antigenic substances is a much more difficult matter than that of leprosy, owing to the frequent involvement of organs essential to life and health and the grave risk of dangerous focal and general reactions, to say nothing of the possibility of exciting septicaemic processes and secondary bacterial deposits. He quotes both animal experiments and human tests as to the action of the chaulmoogra derivatives in tuberculosis and concludes that, on the whole, the results are very disappointing. The personal experience of the reviewer, so far as it goes, confirms this view for pulmonary tuberculosis ; but it would be a pity to abandon attempts to exploit these highly active substances in such localized processes as lupus in which " reaction " appears to be fairly well tolerated and to assist in ultimate cure.

The most interesting and important part of the paper is that which deals with " further clinical trials of sodium morrhuate " in tuberculosis. Here, as was certain to be the case, the results reported are far from uniform ; in fact, sometimes contradictory, varying from the very optimistic records of the late P. W. R. BOELKE and of Dr. John

HUME to the provisional verdict of " inconclusive and not very encouraging " of R. C. WINGFIELD and the " harmless and of no benefit " of Fenwick JONES. [In a disease like tuberculosis in which the clinical picture is of infinite variety and the prognosis, under the ordinary conditions of life and apart from any kind of treatment, as various as the clinical types, attempts to evaluate the action of " curative " agents is fraught with difficulty. The physician is faced, on the one hand, with the fact that certain cases tend to establish their own immunity and to get well of themselves, while others are doomed to go down hill rapidly owing to factors which are quite beyond therapeutic control. It is just as hard to be sure that a " success " is to be justly claimed as that a " failure " of the patient to improve is, in reality, inherent in the treatment. In this dilemma, it is clear that final knowledge as to the value of any given form of treatment can only be obtained by a prolonged trial in carefully classified cases, under the observation of men with real knowledge and experience of the disease.] It may safely be said that a year or two will see the end of any treatment which fails to satisfy the needs of the experienced clinician. The reports quoted by Rogers of considerable numbers of cases treated by Dr. Charles LLOYD and Dr. T. WILLIAMS, both of whom are favourably impressed by their results, are decidedly encouraging, especially since, in the knowledge of the reviewer, both these workers continue to be impressed with the value of sodium morrhuate in suitable cases.

There remain to be tried the ethyl ester morrhuate and the alternate administration of courses of the morrhuate and tuberculin, the latter method having given encouraging results at Fazakerley Hospital in the hands of Dr. RUNDLE and his colleagues. There can be no doubt of the *activity* of these new preparations suggested by Sir Leonard Rogers ; and this fact is sufficient, in itself, to justify their thorough trial in the treatment of tuberculosis in all its forms.

S. L. C.

BASSETT-SMITH (Percy W.) & GLOYNE (S. Roodhouse). **Excess of Vitamin B in the Treatment of Experimental Tuberculosis.**— Reprinted from *Tubercle.* 1924. June. 5 pp. With 7 charts in text. [4 refs.]

Nine guineapigs in all, four at Victoria Park and five at the Bland Sutton Institute, were used in these experiments, five serving as " controls." In the test animals and the " controls " alike, a generous diet of crushed oats and green vegetables was given. In the " test " group, 8 grams of " marmite," a commercial yeast preparation rich in Vitamin B, was given daily in addition, being made into an emulsion with water and mixed in with the oats. The test and control animals, after some weeks of preliminary observation, were inoculated subcutaneously with a small dose of virulent " human " tubercle bacilli. All died, in periods varying from 112 to 209 days after the inoculation (two of the test animals of secondary pneumococcic infection, but whether tuberculosis was also present at post mortem examination is not stated)* ; and in both the Victoria Park test animals and in one of the test animals at the Bland Sutton Institute, generalized tuberculosis was present.

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* Sir Percy BASSETT-SMITH says that there was no evidence of tuberculosis post-mortem.

It is impossible, as the authors admit, to draw any conclusions from this small series of experiments. Subcutaneous inoculations of from 125,000 to 250,000 virulent tubercle bacilli are, in themselves, so deadly a dose for guineapigs that they leave no margin for the evaluation of therapeutic effects. S. L. C.

Row (R.). **Further Observations on Tubercle Bacilli subjected to Autolysis, with Special Reference to the Antigenic Value of their Lipased Products.**—*Indian Jl. Med. Res.* 1924. July. Vol. 12. No. 1. pp. 195–197. [2 refs.]

This paper follows on a publication by the same author in the *Indian Journal of Medical Research* (1922).

If a mass of tubercle culture be self-digested for several weeks in a medium of normal saline and then, after treatment with petroleum ether, set aside to stand, it separates into three layers. The lowermost of these is unimportant, consisting almost entirely of the salt solution in which the digestion had taken place. The topmost layer, amber coloured, consists of the petrol ether which has taken up the lipased products of the fatty or waxy components of the bacilli. When evaporated after filtration, this layer yields " a waxy brownish-red mass " of fatty acids. Neutralized with alkalis, it yields a colloidal solution which has been found quite inert both as an antigen for complement-fixation tests and also for production of antibodies. The middle layer, consisting of a " whitish cake " of agglutinated tubercle bacilli, for the most part deprived of their acid-fast properties, is of greater interest. " Repeated washing of this mass, after drying, with xylol reduces the acid-fast residuum to a minimum and yields a product which has definite antigenic value."

Rabbits and guineapigs tolerate up to 5 milligrams given subcutaneously and (rabbits) 2 milligrams intravenously; and their sera prove to contain antibodies in considerable amount. They acquire, too, the property of resisting to varying but definite degrees subsequent doses of living tubercle bacilli in quantities that kill the controls in from 3 weeks to 3 months. The treatment of a small number of artificially infected guineapigs gave hopeful results, and preliminary trials on glandular and pulmonary cases in man appear to have shown that the injections are well tolerated and that definite improvement may be noted during the time that the vaccine is being given. Four out of eight glandular cases have done well and three pulmonary cases out of a group, the total number of which is not stated, have improved markedly after " submitting to a long course of weekly injections."

Doses of from 0·01 to 0·02 milligrams are well tolerated in human cases, a local oedematous swelling, if present, subsiding in a few days without further trouble. " The general reaction only is marked, without any reference to dose, and consists of a rise of temperature of one or two degrees during the first 24 hours." A course of at least 10 to 12 injections must be given before decided improvement can be hoped for.

It would appear, from the animal tests, that this antigen may have a future in the treatment of tuberculosis; but the number of experiments recorded is too small, and the details too meagre, to justify definite conclusions at this stage. The results of trials on man, as given, prove at least that the antigen is an active one and that it ought to be used with caution. S. L. C.

REVIEWS AND NOTICES.

YOUNG (T. C. McCombie) [M.D., D.P.H., late Director of Public Health, Assam]. With a Foreword by ROGERS (Sir Leonard) [C.I.E., M.D., F.R.C.P., F.R.C.S., F.R.S.]. **Kala-Azar in Assam. An Account of the Preventive Operations 1910 to 1923, and Notes on the Epidemiology of the Disease in Assam and India.**—pp. viii+76. With 6 figs. 2 maps & 7 charts. 1924. London: H. K. Lewis & Co., Ltd. [Price 7s. net.]

This is a well-written and most interesting account of the author's fight with kala azar during the fourteen years he was in charge of the sanitary department of Assam, which resulted in the most gratifying success both in treatment and prevention. Sanitary prevention was continued on the lines laid down by Dodds PRICE in the early nineties, isolation of the infected and removal of the uninfected inhabitants from the infected area to a new site, a distance of less than a quarter of a mile proving sufficient to arrest the spread of the disease. In addition, the sanitary department treated all the infected by intravenous injections of antimony so as to destroy the infecting protozoan in its only known habitat. On Colonel Young's initiative the Assam Legislature passed a law making it compulsory that when a village or district was declared infected with kala azar:—

(1) Any infected person shall undergo a complete course of treatment.

(2) Such person's house and its contents shall be destroyed (usually by fire) or disinfected.

(3) The other inmates of such house shall be removed to an approved site.

(4) Compensation may be paid.

Migration to or from a notified area was made a penal offence.

It speaks volumes for Colonel Young's tact and the confidence with which he inspired the populace that in most cases they cordially co-operated in the enforcement of these rules. Those who elsewhere in India have had to deal with epidemics and the enforcement of sanitary regulations will be the first to take their hats off to the author.

In his preface Colonel Young pays a well-deserved tribute to the labour, skill and courage of his subordinates. The skill attained under his tuition was such that a Sub-Assistant Surgeon with the help of a single peon would give three or four injections per minute, an almost incredible rate when we know that young children formed the bulk of their patients. Although many of our text-books inculcate slow and intermittent injection of each dose of tartar emetic, accidents were conspicuous by their absence.

While we have nothing but praise for the author's account of his personal observations we cannot agree with his account of the origin of kala azar in Assam. He says " Rogers dates the first appearance of the disease in the Garo Hills at 1879." This figure, possibly a misprint, if true, would support the heresy that the Assam epidemic of kala azar took its origin from the spread of the Rangpur malarial epidemic of 1872-77 across the Brahmaputra to the Garo Hills. Dr. CLARKE, the Sanitary Commissioner of Assam, who in his Report for 1882 gave the first (an excellent clinical) account of the disease, says: " As far back as 1869 the attention of administrative officers in Assam became directed to a peculiar disease called ' Kala azar,' the ravages of which decimated and in some instances almost depopulated numerous villages." He says his details were drawn from " old reports " and a record of 120 recent cases lately visited by Mr. MCNAUGHT. He says, " the Garos give definite accounts of the invasions of their villages at periods varying from 3 to 30 years previously," that is, some villages were attacked in 1852, others at later intervals up to 1879. ROGERS quotes the above and adds that Col. MAXWELL, administrator of the Garo Hills from 1881 to 1883, a very able observer, wrote to him, " Elderly Garos have often told me their grandfathers died of the disease." ROGERS also refers to "reports of the disease in 1869 and 1873." It is obvious that a disease known "as far back as 1869" to officials, and to natives in 1852, cannot be an extension of the Rangpur epidemic that began in 1872. The Rangpur fever cannot have been kala azar: the local doctors were satisfied it was malaria, as was ROGERS also after an exhaustive enquiry in 1897. "The fever was of the intermittent type, the majority of the population were completely prostrated by repeated attacks between May and December 1873." "Eighty per cent. of the people of Rangpur were attacked in 1874." It this were kala azar the most we could hope would be a mortality of 60 per cent., yet the next census showed a decrease of only 2·58 per cent. Further, quinine cured the Rangpur fever.

The author suggests as a possible explanation of the alleged immunity of Cachar in the Surma Valley "that the opening out of this district began only some thirty or forty years ago, before which time the population was sparse." Forty-three years ago the district was well planted in tea. The population of Cachar was then 289,425, including 87,000 tea garden coolies, mostly immigrants. More than half the population of Assam was in the Surma Valley.

Arthur Powell.

FAR EASTERN ASSOCIATION OF TROPICAL MEDICINE. **Transactions of the Fifth Biennial Congress held at Singapore, 1923.** [Edited by HOOPS (A. L.), President, & SCHARFF (J. W.), Hon. Sec. of the Congress.]—pp. xx+974. With 86 plates (2 coloured) and numerous charts in text. 1924. London: John Bale, Sons & Danielsson Ltd., 83–91, Great Titchfield Street, W. 1. [Price 40s.]

The fifth Biennial Congress of the Far Eastern Association of Tropical Medicine was opened at Singapore by the Governor of the Straits Settlements on the 3rd September, 1923, and remained in session until the 8th. Besides the local profession and the representatives of the medical services of the several States of Malaya, the other Eastern countries and places individually represented were Australia, British India (including Burma), Borneo, Ceylon, China, Formosa, Hong Kong, Indo-China, Japan, Macao. Netherlands India, Philippines, Shanghai, Sarawak and Siam. The handsome and liberally illustrated quarto volume that records its *Transactions* contains 974 pages, of which no less than 914 are occupied by original papers presented for discussion. Some of these have been, and others will be, noticed in this *Bulletin*, but here we may take a general survey of their compass.

Of the big subjects of perennial importance naturally Malaria and Beriberi—so intimately bound up with Anglo-Malayan tradition—engaged a great deal of attention, and equally naturally the aspects of malaria upon which the attention was focussed were prevention and things bearing thereon, such as Anopheles mosquitoes and their control and accurate methods of gauging enlargement of the spleen; but there are also some papers on malaria in relation to mental and nervous disorders and the malaria treatment of G.P.I. The contributions to beriberi, too, deal very much with prevention, but they also include a most appropriate essay on vitamins, and two papers on causation that dissent more or less from the generally accepted deficiency theory associated with Kuala Lumpur. The other big subjects before the Congress were Ancylostomiasis, Plague, and Leprosy. Papers on the first of these include two on treatment, and a series of studies of considerable importance on the pathological lesions and disordered functions that contribute to the gravity of hookworm infection. Among the papers on bubonic plague the detailed review of the wild rodents naturally susceptible to infection and of the exact relation of the tarabagan to the Manchurian outbreaks may be mentioned particularly. The communications on leprosy deal largely with modern methods of treatment and also include a further contribution by VAN DRIEL on affections of the eye in leprosy, which is based on a survey of the inmates of the asylum near Deli.

The miscellaneous papers, 35 in number, take a wide range: among subjects included are amoebiasis, helminthiasis, laboratory methods, and instruction in parasitology; antityphoid and anti-influenza vaccination, oral vaccination, and specific natural immunity; yaws, pseudotyphus and other spirochaetous-like fevers; pulmonary tuberculosis in Cochin China; smallpox and vaccination; cancer in the tropics; opium-smoking; the indigenous materia medica of China; chemical composition of gallstones; applications of radiology; hospital construction.

Among official acts, outside the domestic and the social spheres, the Congress approved the recommendations of the Council in respect of quarantine procedure in the Far East, and certain recommendations relating to the control of beriberi—namely, that individual Governments be invited to promote further inquiry into the legal standardizing and the trade manipulation of rice, and to nominate a representative for a Beriberi Committee to report to the next Congress. It also approved a resolution requesting the Health Committee of the League of Nations to arrange, among other things, temporary interchange of sanitary personnel in the countries of the Far East.

Without flattery, these *Transactions* must be said to reflect great *kudos* on the local organizers of the Congress, and to exhibit the Far Eastern Association as a body vigorously imbued with the spirit—also Far Eastern in its nurture—of the Father of Tropical Medicine.

It may be added that the next Congress of the Association will be held in Tokyo, under the presidency of Dr. KITASATO.

A. Alcock.

RODENHUIS (Ypeus). **Over het bestaan van verschillende rassen binnen de soort *Entamoeba histolytica* Schaudinn.** [On the Existence of Different Races within the Species *E. histolytica.*]—Academisch Proefschrift. Amsterdam. 1924. 8°. pp. viii+60. With 1 plate. [80 refs.] (L. J. C. Boucher, The Hague.)

In this Dutch dissertation for the degree of M.D., the author critically examines the question whether the species *Entamoeba histolytica* be divisible into a number of diverse strains or races, distinguishable by the dimensions of their cysts—as is now generally recognized by protozoologists—or in other ways. As a result of certain new observations and measurements of his own, and a detailed discussion of previous work, he ultimately answers the question in the negative: or perhaps it would be more accurate to say that he returns a verdict of "not proven."

Most of the author's observations were made in Holland (at the Municipal Hospital at the Hague) upon "the faeces of a number of patients who had never been outside the temperate zone, and had never displayed dysenteric symptoms." After a long discussion of methods, results, and various fallacies and possibilities of interpretation—which must be consulted in the original by those interested, as the points dealt with are too multifarious for succinct summary—the author states his own views in the form of 21 conclusions, occupying rather more than three pages. Of these conclusions the following appear to be the most noteworthy or novel:—

In measuring cysts of *E. histolytica,* the unit of measurement employed should not be less than half a division on the scale of an ocular micrometer so calibrated that 1 division=1·5μ (*i.e.*, not less than 0·75μ). [This, it may be noted, is a standard originally adopted and justified by the reviewer.] Only those cysts which are approximately spherical should be measured. [This is an arbitrary restriction which tends to introduce uniformity where it does not exist in nature.] Measurements made on cysts suspended in water, physiological saline, or iodine solution, are preferable to those made on fixed, stained, and permanently mounted specimens. [The author adduces no new evidence to invalidate the conclusions of the reviewer in this respect.]

In interpreting the measurements, and the curves constructed from them, " the arithmetic mean forms a better standard of comparison than the summit of the curve " ; but determinations of the standard deviation and coefficient of variation supply useful additional information. [In this connexion it seems worth while to note the following points. If a sufficient number of measurements be made, and the material be really homogeneous (*i.e.*, if there be but one race and not a mixture of races), then the arithmetic mean and the mode of the curve will coincide—extraneous errors being excluded. But if the mean and the summit of the curve are *not* identical, then either the number of cysts measured is insufficient, or the material itself is not homogeneous—*i.e.*, we are dealing with a mixture of races.]

The cysts passed by a given carrier of *E.* ***histolytica*** show variations in size from day to day ; and these variations are usually greater than would be expected if the differences were due merely to errors of sampling. Corresponding variations are shown in the standard deviation and coefficient of variation. Neither the mean diameter of the cysts, nor the apex of the curve, remains absolutely constant from day to day. [Anybody conversant with the subject and persuaded of the personal and other errors ever involved in making measurements will readily accept these conclusions : but that they furnish evidence against the existence of races in *E.* ***histolytica*** may be disputed.]

The occurrence of " strains of *E.* ***histolytica*** with small cysts " (7–9μ in diameter) supplies no evidence in favour of the existence of races, since it has not yet been proved—in the author's opinion—that these cysts really belong to *E.* ***histolytica***. In his view, they belong, indeed, to a different species. [No new evidence is adduced in support of this opinion, from which many other workers—including the reviewer—dissent. It seems noteworthy also that the author does not account for infections in which the mean dimensions of the cysts are intermediate (ca. 9–11μ) between those of " small " (ca. 7–9μ) and " ordinary " (ca. 12μ) strains. Are these referable to yet another species ? And what of the strains having cysts with a mean diameter of ca. 15μ ?]

The study of familial infections gives no clear indication of the existence of diverse races.

All variations in the form of the curves made from measurements of cysts can be interpreted as due, not to the existence of races, but to " quantitatively differing effects of all sorts of environmental influences " which act upon the amoebae before encystation. [Apparently an explanation on the principle " *ignotum per ignotius*."]

" The *minuta*-form of *E.* ***histolytica*** must be regarded as an independent, saprozoic organism, living on [not *in*] the gut wall " ; and, according to the circumstances in which it finds itself, it " can give rise to the appearance of histolytic forms with amoebiasis, or of cysts in the faeces. Its presence is thus not necessarily associated with ulceration of the gut wall or tissue-parasitism." In the opinion of the author, the " *minuta* " amoebae are not precystic forms, but active commensal organisms which, like *E.* ***coli***, ingest bacteria, starch grains, and other bodies present in the faeces—including the cysts of other protozoa. [The reviewer, for one, questions and rejects such statements, believing them to rest upon errors of observation and interpretation.]

There is no evidence of the existence of pathogenic and non-pathogenic—or feebly pathogenic—races of *E.* ***histolytica***. [As the reviewer has already attempted to demonstrate.]

But perhaps the most significant conclusion is that numbered 19. It is as follows ;—

"The ascertained daily fluctuations in the average dimensions of the cysts [from a given case] are less than the greatest difference observed between [the average dimensions of the cysts passed by] different cases. If this difference cannot be bridged over by further observations, then the existence of several races remains as a possibility, though it has not been proved or rendered probable by other observations." [Such an admission, however grudgingly made, surely knocks the bottom out of the case against the existence of races ? At all events, those who believe in the existence of diverse races in *E. histolytica*—distinguishable by the dimensions of their cysts—may still be suffered to cling to their belief until such time as the bridge-builders on the other side have completed their work.]

The dissertation, as a whole, appears to have been written with the object of upholding the views of Dutch workers—especially those of KUENEN and SWELLENGREBEL—on the subject under discussion. Many of the arguments which have been advanced on the other side by English workers are consequently ignored, or summarily dismissed as "improbable" on grounds which are not invariably adequate or convincing. As a piece of special pleading the dissertation is admirable, but it can hardly be regarded—and the author himself makes no such claim for it—as a final verdict on the question discussed. It has the great merit of being clearly written and well printed, and deserves the attention of all interested in the subject with which it deals. Nevertheless, the reviewer, for his part, cannot help thinking that the author's conclusions might have been different if he had studied a larger and less uniform series of infections, and if he had been able to adopt a more critical attitude towards the opinions of his mentors.

Clifford Dobell.

MAYER (Martin). **Exotische Krankheiten. Ein kurzes Lehrbuch für die Praxis.**—pp. vi.+304. With 210 figs. and 2 plates. 1924. Berlin: Verlag von Julius Springer. [Price G. M. 24 ; bound G. M. 25.]

Exotic disease, as offered here, is synonymous with tropical disease, the term "exotic" being considered by the author to be more perspicuous than the term "tropical"—as indeed it is, if "exotic" be assumed to mean exotic to educated countries that enjoy all the conveniences and recognize all the obligations of modern sanitation. The book is, as it professes, a compendium of such diseases, a compendium of facts—full (except for the questionable omission of bacillary dysentery), methodical, concise, didactic—where attention is well concentrated on the disease, its cause, and the pathological phenomena and therapy associated with it, without much reference to the environment or any to the patient. It is a book that is more likely to find favour with the student revising his work and entrenching himself against the examiners than with the man who seeks wisdom and inspiration in the treatment of the sick. A very obvious good feature is its method, the diseases being classed, as far as is possible, according to their natural sources and relations, as protozoal, spirochaetous, bacterial, helminthic, nutritional deficiency, climatic, etc., etc. Another feature of the book is its freedom from superfluities of medical zoology. The author evidently understands that long interludes of taxonomic zoology are a snare and obstruction in a treatise on disease ; but, on the other hand, he does not here—except in his classification—show sufficient appreciation of the fact that the whole concept of "exotic" disease is essentially and distinctively permeated by zoology, and therefore not a little of his medical zoology is infirm and perfunctory. The book is plentifully illustrated, and most of the illustrations are good, though a few—*e.g.*, the figures of *Glossina palpalis*, *Chrysops dimidiata*, and *Entamoeba histolytica*, and the coloured plate of malaria parasites—are poor, and one—namely, the comparison of the eggs of *Ancylostoma duodenale* and *Necator americanus*—is misleading.

A. Alcock.

Fox (Herbert). [Pathologist to the Zoological Society of Philadelphia. Director of the William Pepper Clinical Laboratory, University of Pennsylvania.] **Disease in Captive Wild Mammals and Birds. Incidence, Description, Comparison.** With a Foreword by PENROSE (Charles B.).—pp. vii+665. With 87 plates and 31 charts. 1923. Philadelphia, London & Chicago; J. B. Lippincott Co. [Price 60*s*.]

This handsomely furnished volume is mainly an outcome of a remarkable record of comprehensive post-mortem studies of 5,365 captive wild animals (1,860 mammals and 3,505 birds) that died in the ordinary course of events in the Philadelphia Zoological Gardens during 20 years. Its special utilities are obvious; but here we can only draw attention to its value to the pathologist, nosographer, and experimental biologist as an admirably arranged storehouse of variously suggestive facts.

Nearly half of the text is descriptive of observed pathological changes and lesions directly and indirectly associated with them, the observations being arranged primarily according to the organic system and site affected and subordinately according to incidence in the zoological system. In the multitude of facts recorded the comparative pathologist will find much that is interesting and curious, if nothing very surprising, and the experimental pathologist many suggestions.

Of a wide interest is the brilliant essay on the relation of diet to disease, contributed by Dr. E. P. CORSON-WHITE. Here, from a text provided by an analysis of the post-mortem records, a most perspicuous argument is developed, in the comprehensive scope of which the principle that the appraisement of a diet must take into account the by-products of digestion and metabolism and the influence upon the intestinal flora [the fauna, particularly the varied fauna of ruminants, having not yet obtained general recognition] is not ignored. Confining attention merely to some significant facts, it is to be noted (1) that carnivorous birds and mammals showed a large variety of diseases of the alimentary tract and its accessory glands and of the kidneys, and that thyroid disorders were almost entirely confined to the Carnivora and rickets to the young of that Order; (2) that a succulent vegetable diet (à diet very favourable to bacteria) gave in mammals the lowest percentage of degenerative visceral changes and the highest of acute gastritis with lesions mostly adjacent to the pyloric opening; (3) that a dry vegetable diet (grain and hay, the latter very favourable to streptococcus, staphylococcus, and *Bacillus refringens*) provided in mammals the greatest number of cases of malnutrition, food-poisoning, pancreatitis, acute degenerations of liver, heart and arteries, and almost all the cases of arthritis; (4) that a mixed diet of flesh and plant food showed a low percentage of diseases of the alimentary tract and its accessory glands and of the kidneys, but (in mammals) a very high percentage of anaemias and osteomalacia; and (5) that evidence of gout, commonly noticed in birds, was not observed in any mammal.

Of true tumours, 93 were discovered in 92 animals (48 mammals and 44 birds) in the course of the 5,365 autopsies. Their incidence embraced all the mammalian Orders—except the three (bats, Insectivora, and Monotremata) that are sparely or never represented in zoological gardens—being heaviest on rodents, marsupials, and Carnivora (in that succession) and lightest on monkeys. Among the 9 Orders of birds affected over 50 per cent. of the incidence fell on the Psittaci, parrots being prone to renal and adrenal tumours. The 93 tumours observed include fibroma, osteoma, chondroma, lipoma, myoma, glioma, angioma, endothelioma, sarcoma (16 cases), papilloma, epithelioma, adenoma (19 cases), carcinoma (25 cases) and hypernephroma; in microscopic as in gross appearance these tumours were essentially the same as in man.

Tuberculosis was observed in 492 (9·1 per cent.) of the 5,365 autopsies, though it was not always the actual cause of death. The mammalian share of infection was 14·7, the avian 6·2 per cent. The mammalian incidence was distributed among Primates (38·5 per cent.), Lemurs (26·7), Carnivora (3·5), Rodents (2·5) and Ungulata (9·6). Also 2 of 3 elephants that came under observation were infected. Infection *via* the air-passages was judged to predominate in mammals (excepting Primates) and also in three Orders of birds (Passerines, Owls and Ostriches); infection *via* the alimentary canal in birds (except the three Orders named) and in Primates. The tubercle bacillus, from whatever particular site, appeared to be generally infective—*e.g.*, human bacilli were found in numerous Orders of birds and mammals. Incidental to the subject of tuberculosis some interesting facts are given respecting the normal temperature of various species of monkeys and apes.

With regard to mycosis, "judging by our experience it would seem probable that the Aspergillus can, under conditions not fully explained, cause inflammation of the avian air-sac and tubercles in the viscera." The action of the fungus cannot be entirely mechanical, since besides a mere suffocative invasion an infiltrating mycotic pneumonia may occur, and also a chronic nodular necrotic impregnation of lungs, air-sacs, liver, spleen, and gut.

A chapter on streptotrichoses contains, among other things, a very full account of the fatal malady known as Kangaroo disease, peculiar to that marsupial family. The disease is due to a Streptothrix (or Nocardia); it is not communicable in the ordinary sense and may occur sporadically in kangaroos not recently imported or brought in touch with recent imports. It first becomes manifest, like actinomycosis, in swellings and ulcerations of the buccal region, where the streptothrix is believed to find its way through some casual abrasion of the mucosa (*e.g.*, as by sharp points of grass), but the point of general interest is the author's suggestion that the further progress of the streptothrix to ulcerative and septicaemic issues is aided by a certain minute, gram-negative, non-motile bacillus which he has frequently found in the lesions and exudates.

Among the miscellaneous infections encountered may be mentioned diphtheria in cassowaries, and an extensive development of molluscum contagiosum, with characteristic "molluscum bodies" but without the lobules of epithelium penetrating into the corium, on the head of a wild Turkey.

In the final chapter, by Dr. F. D. WEIDMAN, on the Animal Parasites encountered—chiefly parasitic worms—the utilitarian and economic value of this branch of zoology is emphasized. Among matters of medical interest it is mentioned that hookworms have been found in wolf and several species of foxes, wild cats and other Felidae, and in giraffes, Malayan tapir, and Californian hair seal, but that none of them is either of the species that infests man; also that 6 fatal cases of amoebic dysentery occurred in American monkeys, the amoeba found in the faeces and in sections of the gut *not* being *Entamoeba histolytica*.

We can but mention—being outside our purview—the humanizing "Foreword" and the philosophical Introduction of this opulent book.

A. Alcock.

JAUREGUIBERRY. **Les blancs en pays chauds. Déchéance physique et morale.**—60 pp. 1924. Paris: A. Maloine et Fils, Éditeurs. 27, Rue de l'École-de-Médecine.

An average European who spends the best years of his life amid the docile and pusillanimous population of a remote tropical settlement, dreadfully attended by a host of obsequious servants, taking no exercise, and using no muscles but those perpetually engaged in mastication and imbibition, is pretty certain—if he escape the prevalent diseases of the country—to become lazy, vain, pompous, and excessively corpulent; we all know Jos. Sedley, the famous Collector of Bogglywallah, and the picture of him eating the air on his appropriate elephant.

To the author of this startling book—who does not appear to be acquainted with Mr. Jos. and, indeed, expressly excludes the British tropical dominions from his purview—it is the fate of Frenchmen expatriated in the tropics to suffer there a change into something compared with which Mr. Jos. Sedley would appear a Bayard.

This change, which the deluded victims of it imagine to be "acclimatization," is brought about by complete abstinence from physical exercise, devotion to a sedentary or a semi-recumbent posture, over-indulgence in refreshments, much solitude, and the subtle-inexorable influences of an inferior civilization. These things are the direct effects of a tropical climate, which European sanitation and the cult of athletic sports may mitigate temporarily for the individual, but not permanently for the race.

The author describes with considerable acerbity the results of this acclimatization, physical and mental. The pampered belly becomes swollen like an egg ("œuf colonial") and pendulous. The disused legs become atrophied, and so disproportioned to the enormous belly that the human profile is transformed to the likeness of a frog ("type batracien"). If we could look into this batrachian abdomen we should find bloated viscera lying beneath loads of fat. No wonder that the poor victim has an earthy potato face ("masque colonial") and is decrepit and bald before his time. If we follow further the results of acclimatization we find the man to be sententious, pompous, and volubly omniscient; foolish and vain and irritable as a child; forgetful of everything but trivialities and the divinity that hedges himself; boastful of his exploits and escapades, but pusillanimous as a hare. Worst of all, he has almost lost his soul, for his conscience has sunk to the level of the unregenerate heathen around him. He may even be sexually depraved. Such is the picture the writer gives us of his exiled compatriots in the tropics; and surely not Mrs. Candour nor Lady Sneerwell, nor even Sir Benjamin Backbite himself ever portrayed their bosom friends in more extravagant outline or darker colouring.

The author's fierce passages, though some of them strike you like blasts from the pit, are not altogether what Carlyle describes as "splenetic atrabiliar reflections" of a misanthrope; it would be more charitable to liken them to the patriotic declamatory warnings of the minor prophets. He sees the nations of Europe intent on colonial expansion and on visions of tropical countries made amenable in a millennium ruled by Hygeia. These visions he denounces with greater extravagance as delusions. So far as France is concerned, "may the colonies and their products go to the devil if colonial intercourse is to contaminate the blood that has inscribed 'Verdun' on the scroll of glory." Of course, there must be commerce with tropical countries, and in this enterprise only men between 25 and 40, or perhaps 50, years should engage. He appears to approve the British method of recruiting good men for colonial service, and giving them frequent opportunities of recuperation in Europe. He undoubtedly approves the British mode of vigorously resisting the enervating influences of the tropics by games and all forms of outdoor exercise—this, at any rate, will put an end to the "œuf colonial," the "type batracien," and the "masque colonial," and will mitigate the ennui that imperils the soul.

A. Alcock.

OXFORD (Eduardo). **Geografía médica del Yuruary. Trabajo presentado al tercer Congreso Médico Venezolano, celebrado en Valencia, capital del Estado Carabobo, en el mes de junio de 1921.**—134 pp. With 1 map & 15 figs. 1924. Caracas: Litografia del Comercio.

Yuruary is a territory to the east of Bolivar, situated between it and British Guiana. The work under review is of the nature of a combined guide-book and catalogue. It is divided into two parts, geographical and medical. The first part deals with physical characters, geology, climatology, flora, fauna, and ethnology. The Flora is a rich one; over 170 medicinal plants are mentioned (with brief notes as to their uses) and among them are several which are recommended for dysentery and other intestinal conditions, and might be worth the attention of pharmacologists. The Fauna includes 8 varieties of poisonous snakes, 4 poisonous spiders, scorpions, and centipedes.

The second part deals with the medical aspect. Malaria is most widespread, though certain districts are free, notably El Palmar in Piar and part of Guasipati in Roscio. During July, August, September and part of October it becomes almost epidemic in character. Enteric fever, smallpox, diphtheria, scarlet fever, yellow fever and dysentery, both bacillary and amoebic, are met with. As regards parasitic diseases, hookworm is fairly common; filariasis and schistosomiasis have been recorded. No statistics of prevalence of any morbid conditions are given. There is, finally, a febrile affection of unknown nature which occurs at all seasons and goes by the name of "prolonged fever," though the attack lasts only 5 days as a rule, in some cases 9–11 days. No work of investigation into this appears as yet to have been attempted.

H. Harold Scott.

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